

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series (Parts 610-619)

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Chapter 2 Glossary

610.2

Acquired lands. Lands in Federal ownership which are not public lands, having been obtained by the Government by purchase, condemnation, gift or by exchange.

Applicant. An individual, corporation, state or local government, applying for rights in, or title to, public lands or resources.

Application. A formal request, usually to the Bureau of Land Management, for rights in, or eventual title to, public lands or resources.

BLM. Bureau of Land Management.

BMC. Branch of Mineral Classification.

BOGO. Branch of Oil and Gas Operations.

BOMO. Branch of Mining Operations.

Cadastral survey. The establishment of land boundaries and their identification on the ground by monuments or marks and their identification in the records by field notes and plats.

CFR. Code of Federal Regulations.

Cooperative agreement. An agreement entered into by the Survey and BLM, approved by the Secretary of the Interior, establishing procedures for mineral evaluation in Federal land alienation cases.

"Co-cps". Usually alienation cases, such as homesteads, public sales, etc., upon which the Survey is requested by the BLM, through a cooperative agreement, for a mineral and waterpower report.

Deposit. Under the Act of August 8, 1946, this term is regarded as being an accumulation of hydrocarbons.

Federal lands. As used in this manual, it includes public, acquired, and Indian lands.

GPO. Government Printing Office.

Lease. A document which authorizes the development and production of leasable minerals from public lands, and all minerals on acquired lands.

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Leasable minerals. On public lands: coal, oil and gas, phosphate, sodium, potassium, oil shale, sulfur (Louisiana and New Mexico), asphaltic materials, solid hydrocarbons, helium. On acquired lands: all minerals except common varieties.

Legal subdivision. In a general sense, a subdivision of a township, such as a section, quarter section, lot, or tract, etc., which is created by cadastral surveys and authorized under the public land laws.

Locatable minerals. Those minerals other than the leasable minerals, usually of a metallic nature, subject to entry under the mining laws such as gold, silver and copper, but also bentonite, gypsum, etc.

Mineral lands. Public lands which have been designated as containing, or known to contain, valuable minerals.

Mineral Leasing Act. The act approved February 25, 1920 (41 Stat. 437, et seq.) which provided for leasing of certain minerals on Federal lands.

Mineral withdrawal for classification. A withdrawal of public lands which are potentially valuable for leasable minerals precluding the disposal of the lands except with a mineral reservation clause unless the lands are found, upon examination, or by other competent evidence not to contain a valuable deposit of mineral.

Minutes. Recorded summary of geologic data, history of executive actions, and the development of conclusions affecting the classification of lands.

Organic Act. The Act approved March 3, 1879, which established the Geological Survey (20 Stat. 377-394).

Patent. A document which conveys to the patentee legal title to public lands.

Prospecting permit. A document which authorizes prospecting for certain leasable minerals on public lands and all minerals on acquired lands.

Public land. Original public domain lands which have never left Federal ownership and such lands that have reverted to Federal ownership through operation of the public land laws.

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Surface entry. An application for rights to land exclusive of the mineral rights.

Surface rights. Rights to land exclusive of mineral rights.

U.S.C. United States Code

Valuable mineral. A deposit of a mineral ore or substance which is useful in commerce or the arts. Occurring in quantity and quality sufficient to justify its mining and removal for sale; also, any quantity of such ore or substance in a vein or lode, the size and continuity of which are such as to justify an ordinary prudent man in the expenditure of his labor and means in an effort to develop a paying mine.

Valuable prospectively. A determination of potential mineral value of Federal lands. It is applied to those lands where geologic data suggests that the mineral may be present meeting classification standards.

Withdrawal. An action which restricts disposal of public lands and which holds them for specific public purposes.

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Part 610 General

Chapter 3 Scope and Maintenance of Manual

610.3.1

- .1 Scope. This program manual is prepared as parts 610-619 of the Conservation Division Manual (Parts 600-699) and so far as is practicable follows the format of the Geological Survey Manual.

It is the purpose of this manual to outline and briefly describe the functions assigned to the Branch and the procedures employed in fulfilling these functions, with citations of statutory and delegated authorities for each of the assigned duties including references to governing regulations and cooperative agreements and arrangements with other bureaus and agencies under which the Branch jointly participates. The assigned duties of the Branch are primarily in that area of public land administration requiring the application of geology. However, the activities are varied and although in general are influenced by, Public Land Regulations, Titles 30 and 43 CFR, the procedures of the Branch have not been governed by any formal regulations. It is, therefore, the objective of the manual to provide a concise summary of the responsibilities imposed on the Branch with pertinent references to the statutory and delegated authorities under which the duties have been assigned. Where no precise delegation is recorded and the work has been historically performed by the Branch, this manual, when officially approved, will provide such delegated authority.

The Mineral Classification Handbook of Instructions was prepared in July 1960 as a guide to Branch geologists, and complements the manual by providing instructions in field methods and standards employed in performing geologic investigations. Consequently, appropriate cross references to the Handbook are employed in the manual.

Aside from references to the Handbook, the manual contains references to the U. S. Statutes at Large; Code of Federal Regulations, Titles 25, 30, and 43; Departmental, Geological Survey, and Bureau of Land Management Manuals; Departmental and Geological Survey orders; and Conservation Division and Branch instructions and letters relating to work procedures.

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610.3.2

- .2 Maintenance. Maintenance of this portion of the Manual, on a current basis, shall be in conformity with section 301.1.7, Administrative Series of the Geological Survey Manual. Changes in policies, objectives, or standards affecting the functions of the Branch will be contained in consecutively numbered Manual releases which shall transmit a replacement page of the Manual, the page being replaced shall be removed and destroyed. Minor changes also may be accomplished under the same method with the release showing the additions, deletions, and corrections to be made in the existing texts. It will be the responsibility of each office and each individual possessing an official copy of the Manual to make the changes indicated in the Manual releases, thus keeping all official Branch Manuals in a current status.

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Part 610 General

Chapter 4 Creation, Objectives, and Functions

610.4.1

- .1 Creation. The Geological Survey was established by the Act of March 3, 1879 (20 Stat. 391; 43 U.S.C. 31), which imposed upon the Director two distinct types of duty: (1) the classification of the public land, and (2) the examination of the geologic structure and mineral resources. The responsibility for mineral land classification as it is now applied is assigned to the Branch of Mineral Classification which is an organizational unit of the Conservation Division of the Geological Survey. Its organizational form and functional operations have developed through legislation and executive, departmental, and bureau orders in recognition of the needs of scientific mineral land classification as an integral part of public land administration.

The Director, Geological Survey, in the first annual report to the Secretary of the Interior, dated November 1, 1880, stated that it was his conclusion that the intent of Congress in the enactment of the legislation creating the Geological Survey was "..... to begin a rigid scientific classification of the lands of the national domain, not for purposes of aiding the machinery of the General Land Office by furnishing a basis for sale, but for the general information of the country...." This interpretation of the intent of Congress as expressed in the Organic Act prevailed until 1906, when it became evident that adequate classification of mineral lands was essential to effective public land administration. Legislation of that era made it plain that it was the intent of Congress that public lands be classified and that disposal of lands be in accordance with such classification of the lands into types recognized in the statutes.

On June 29, 1906, the President directed the Interior Department to report valuable coal lands, so that they could be withheld from entry under the Public Land and Mining Laws. The Geological Survey, from data accumulated in its records, prepared maps showing the location of coal lands in the western public land states. As directed, the General Land Office withdrew from entry the lands designated by the Survey as valuable for coal (USGS Bull. 537, 1913, "Classification of the Public Lands").

A series of orders from the Secretary of the Interior defined the roles that the General Land Office and the Geological Survey would bear in public land administration with the Survey being made chiefly responsible for the classification of lands for their mineral character. From these actions the Survey's responsibilities became clear, and as demands upon

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the Survey for information became more frequent and numerous it became necessary to create within the Survey a unit responsible for the assemblage of information obtained from field investigations and the conversion of such data into a form suitable for classification. To provide for this activity the Land Classification Board was created by order of the Director on December 18, 1908.

Historically, classification has remained in this unit since 1908, although various organizational changes have been made. By Survey Order No. 10 of May 1, 1912, the Land Classification Board was given the rank of branch (now division). With the assignment of the supervisory responsibilities of the Mineral Leasing Act from the Bureau of Mines, the Conservation Branch was created by Survey Order No. 115, dated July 1, 1925, which provided that:

"The Conservation Branch (now Division) will continue the functions of the former Land Classification Board, together with the mineral leasing activities transferred today from the Bureau of Mines."

From this chain of events emerged the Mineral Classification Branch as the unit charged with the duties of mineral land classification. Except for expanded responsibilities in its participation in the administration of the Mineral Leasing Act and a broadening of cooperation in an advisory capacity for intradivision, intrabureau, and interagency activities dealing with mineral resources of lands under the jurisdiction of these government units and a redesignation of title, the Branch of Mineral Classification has functioned along similar lines since its creation in 1908 as the Land Classification Board. (See USGS Bull. 537, 1913, "Classification of the Public Lands".)

- 2 Objectives. The role of the Branch of Mineral Classification in its prime objective is (1) to conduct a scientific classification of the lands under Federal jurisdiction to determine the actual or probable presence of leasable and other mineral deposits of value on such lands anywhere in the United States or its territories; (2) to prepare geologic maps and reports and assemble the data required in the mineral classification of Federal lands; (3) make certain technical determinations of a geologic nature required in the administration of the Mineral Leasing Act of 1920 (as amended); (4) to furnish other Federal administrative and supervising agencies with geologic determinations and counsel

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requisite to the management of the lands under their jurisdiction;
(5) to maintain a file of the data accumulated by field investigations in a manner that the collected geologic data may be readily translated into a classification of the mineral resources of Federal lands, and to prepare for open file or publication the results of these investigations.

- .3 Functions. To fulfill these objectives the Branch maintains a staff of geologists strategically located to conduct the field investigations necessary to provide a basis for classification.

From field and laboratory data and other sources including suitable work by the Survey or other agencies, the Branch (1) determines the land areas of potential value for the leasable minerals that are to be withdrawn for purposes of mineral investigation and classification; (2) classifies the lands as being mineral or nonmineral in character; (3) initiates order for the formal classification of those lands mineral in character, and recommends the restoration of those lands after classification; (4) assemble the acquired data into a systematic record upon which daily determinations may be made as to the mineral character of Public, Acquired, and Indian lands subject to disposal under appropriate statutes; (5) under the provisions of the Mineral Leasing Act defines the areas to be included in "Known Geologic Structures" of producing oil and gas fields; under the provision of the Act of August 8, 1946, determines the producing limits of oil or gas fields and the determination of "discovery of new deposits"; reports to the Bureau of Land Management on the first discovery of oil or gas and other leasable minerals on or affecting Federal lands; (6) reports on all oil or gas lease offers as to whether or not such lands are subject to noncompetitive or competitive leasing; (7) recommends the logical area of proposed unit plans and participating areas; (8) provides advisory services to other Branches of the Division and performs geologic investigations that may be required in determining the feasibility of potential dam or reservoir sites and the administration of the Mineral Leasing Acts, including the Outer Continental Shelf Lands Act; and (9) provides geologic counsel to bureaus of the Department and to other governmental agencies on problems relating to administration of lands under their jurisdiction, particularly and most frequently in determining the mineral resources of lands subject to disposal.

To systematically map and evaluate the large areas in need of mineral land classification a program of general geologic mapping is under way in the western states and Florida.

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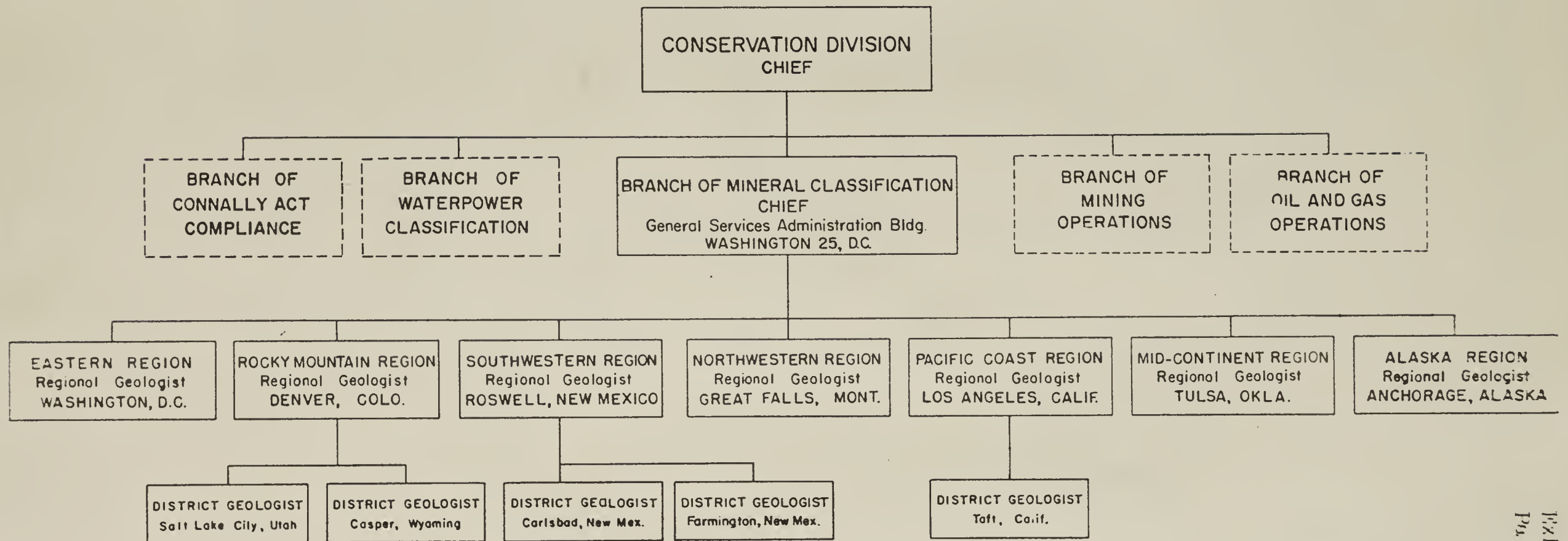
Chapter 4 Creation, Objectives, Functions, and Organization

610.4.4

Following administrative determination as to priority and coverage, this mapping is performed on a quadrangle basis for the most part, thus assisting in the geologic mapping of the United States.

- .4 Organization. The Branch is organized along regional lines as shown in Exhibits 1 and 2 with overall administration by the Branch headquarters in Washington, D. C. The field force is organized into regions, some of which include suboffices to better provide cooperation with other branches of the Division. A Regional Geologist is in charge of each regional office with such personnel as the work requires and suboffices are in charge of a District Geologist. These field units conduct the necessary field investigations required in the conduct of the functions of the Branch, reporting the results of their findings with appropriate recommendations to Washington. In many cases the field staffs initiate the formal procedures of the actions performed by the Branch. Final preparation and recommendation for formal classification or transmittal of recommendation for the withdrawal or restoration of lands is prepared by the Washington office staff.

ORGANIZATION CHART
BRANCH OF MINERAL CLASSIFICATION
CONSERVATION DIVISION
GEOLOGICAL SURVEY



UNITED STATES
DEPARTMENT OF THE INTERIOR

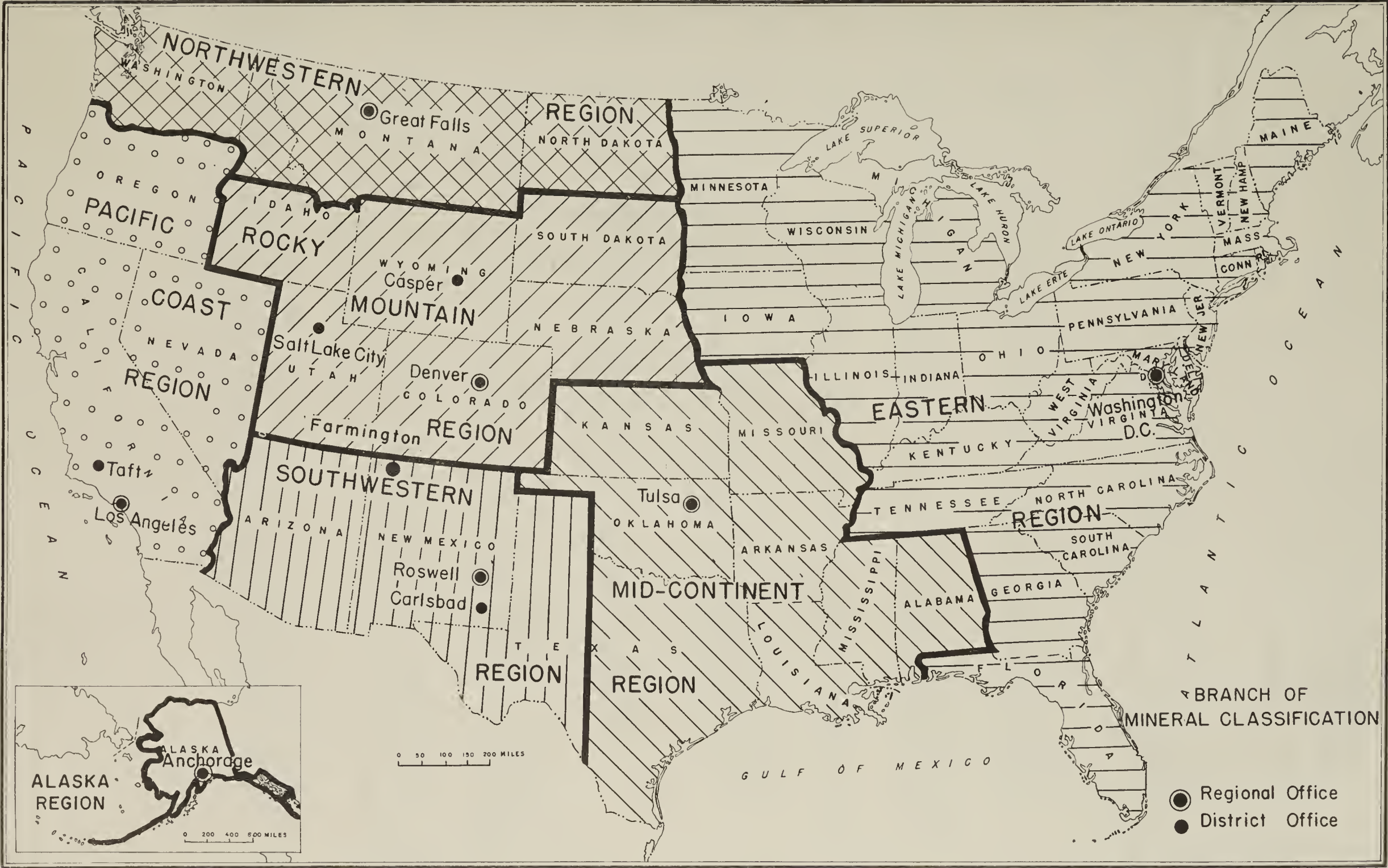


Exhibit 2
Part 610, Chapter 4

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Part 611 Formal Classifications - Public Land

Chapter 1 Authority

611.1.1

- .1 Statutory. The following cited acts provide the authority under which the Department of the Interior is charged with the responsibility of the classification of the mineral or waterpower resources on the public domain:
- A. March 3, 1879 (20 Stat. 377-394). The "Organic Act", which creates the office of the Director of the Geological Survey with the responsibility for the classification of the public domain.
 - B. February 26, 1895 (28 Stat. 683). Authorized the Secretary of the Interior to classify Northern Pacific Railroad lands in Montana and Idaho.
 - C. March 27, 1906 (34 Stat. 88). Authorized the Secretary of the Interior to reclassify public lands in Alabama.
 - D. June 25, 1910 (36 Stat. 847). Provides the authority of the President to withdraw lands from entry and to reserve such lands for waterpower sites, irrigation, classification, or other public purposes.
 - E. August 24, 1912 (37 Stat. 497). Amends the act of June 25, 1910, by providing for the location of only metalliferous minerals under the mining laws on withdrawn lands.
 - F. July 17, 1914 (38 Stat. 509). All lands withdrawn or classified as phosphate, nitrate, potash, oil, gas, or asphaltic mineral, or which are reported as valuable for such deposits, were opened to surface entry with a mineral reservation to the United States.
 - G. May 24, 1950 (64 Stat. 1262) as amended July 5, 1952 (66 Stat. 121). Transfers to the Secretary of the Interior all functions of other officers of the Department and all functions of all agencies and employees of the Department.
- .2 Delegated. The following Departmental, Bureau, and Division orders, regulations, or manuals contain delegations of authority under which the Branch of Mineral Classification is charged with the duties relating to the withdrawals and classifications.

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Chapter 1 Authority

611.1.2A

- A. Departmental Order No. 2563, May 2, 1950.^{1/} Each function transferred to the Secretary of the Interior by Sec. 1 of Reorganization Plan No. 3 of 1950, May 24, 1950, is assigned to the officer, employee, or agency from whom or from which it was transferred.
- B. Geological Survey Manual, Organization Series. Part 120.4.1D, October 20, 1959 (Release 310), assigns to the Branch of Mineral Classification the task of the classification of "Federally-owned land as to their mineral values, and (it) performs all activities designed to prevent alienation of Federally-owned mineral values under inapplicable laws;...."
- C. Departmental Manual, Public Land Series. In Part 603, Land Withdrawal Program November 20, 1962 (Release 568) 603.1.2A requires that all orders relating to land withdrawals and restorations shall be submitted to the Assistant Secretary for Public Land Management; 603.1.2C reads "The Geological Survey, having primary responsibility for mineral and water power classification, is responsible for continuing review of those classification programs and, in cooperation with the Bureau of Land Management, for initiating classifications and restorations in whole or in part of previous classifications when available information and considered judgment indicate that the continuance of such classifications are no longer in the public interest."

^{1/} Departmental Order No. 2563 was issued prior to final approval of Reorganization Plan No. 3 of 1950, Sec. 2 of which stated "This order will take effect immediately after Reorganization Plan No. 3 of 1950 becomes effective."

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Chapter 2 Withdrawals

611.2.1

- .1 Mineral Land. When available records or preliminary investigations indicate that tracts of public land may contain deposits of potentially valuable leasable minerals and it is deemed to be in the public interest to protect such lands from disposal under inapplicable laws, the Branch may submit to the Manager of the appropriate Land Office, Bureau of Land Management, through the Director, Geological Survey, an application requesting withdrawal pending investigation and classification of the public lands involved. The application shall contain a legal description of the lands and a statement as to the purpose of the withdrawal. The manager will then initiate the prescribed action (BLM Manual, Vol. V, Part 4, Chap. 1) which includes publication of the proposed withdrawal in the Federal Register, public hearings if required, and if approved by the Secretary, the issuance of a Public Land Order (Departmental Manual, Part 603; 43 CFR 295.10).
- .2 Dam and Reservoir Sites. The responsibility of requesting withdrawals and the classification of dam and reservoir sites is that of the Branch of Waterpower Classification which initiates the prescribed actions for the withdrawal of lands classified or favorable for dam and reservoir sites (Geological Survey Manual, 120.4.1D). The Branch of Mineral Classification will conduct geologic examinations at the request of the Branch of Waterpower Classification and will prepare a report containing recommendations as to the geologic feasibility of the site. These reports are usually to be prepared for publication in the Water-Supply-Paper or Bulletin series of the Geological Survey (Part 619.2.3C(1), this Manual).

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Chapter 3 Mineral Land Classification Board

611.3.1

- .1 Date, Method, and Basis of Establishment. Established with headquarters in Washington by memorandum from Chief, Conservation Division, dated October 31, 1962, to perform functions previously assigned to the various mineral classification boards.
- .2 Purpose or Functions. To study (1) economic and engineering factors relating to the potential development, present and future, of the leasable mineral resources of the public domain. Based on these studies to recommend to the Director criteria or standards which shall be applied for the classification of lands believed to contain deposits of such minerals; and (2) review results of geologic examinations, translating the accumulated data into a form adaptable to the classification of the public lands as mineral or nonmineral in accordance with the approved criteria for classification.
- .3 Representation:

Chairman: Chief, Branch of Mineral Classification
Alternate Chairman: Acting or Assistant Chief, Branch of Mineral Classification
Members: Staff geologist and/or geologists, Branch of Mineral Classification, Washington
- .4 Type of Organization: Permanent
- .5 Reporting: To Chief, Conservation Division, and Director, Geological Survey
- .6 Staff: As needed.
- .7 Meetings: At call of Chairman.
- .8 Permanent Field Committee (For Mineral Land Classification Board in the Field):

Chairman: Regional Geologist, Branch of Mineral Classification, of region in which lands are situated.
Members: Chief of Party and/or geologists(s) who conducted or supervised field examination.
- .9 Termination Date: None.

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Chapter 4 Standards for Mineral Land Classification - Leasable Minerals 611.4.1

.1 Approved Criteria. The Mineral Land Classification Board as established within the Branch of Mineral Classification (Part 611.3, this manual) is responsible for conducting study and research of economic factors that would apply to the present or future development of the leasable minerals for the purpose of preparing reasonable criteria or standards for the scientific classification of lands believed to contain deposits of leasable minerals. These criteria when approved by the Director of the Geological Survey will be the formula which shall be applied for determining whether the leasable minerals that occur in the land meet minimum classifiable limits. Criteria for mineral land classification of the following leasable minerals will be made public by the Geological Survey circular or bulletin, or by any other means that the Director might approve or require.

- A. Coal — *Circular 633*
- B. Oil and Gas (including all other natural gases, such as carbon dioxide and helium)
- C. Phosphate
- D. Sodium
- E. Potassium (Potash)
- F. Oil Shale

(Standards of mineral land classification for sulfur in New Mexico and Louisiana only, and asphaltic minerals, and other solid hydrocarbons, are under consideration.) - *1962*

Geothermal - Circular 647

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Part 611 Formal Classifications - Public Land

Chapter 5 Classification - Procedures

611.5.1

.1 Field Investigations. Field work for the purpose of mineral land classification may be proposed by Branch or Division personnel or assigned by the Chief, Branch of Mineral Classification. Work on field proposals for formal projects will not be started until approved by the Chief. When initiated by the Chief, he will advise the Regional Geologist of the area to be mapped, the purpose and objectives of the assignment or project, and any further information of importance.

A. Geologic Examinations, Investigations and Projects.

- (1) Examinations are brief spot checks made at the discretion of authorized field personnel and do not require approval of the Chief of the Branch.
- (2) Investigations are areas of limited size for which data for mineral land classification are required for immediate administrative determinations. In this category the Regional Geologist will proceed with the requested field examination without formally establishing a project.
- (3) Projects are field investigations of broader scope requiring more detailed examination and are assigned as formal projects. The Regional Geologist, guided by the expressed objectives of the project, will prepare for the approval of the Branch Chief, Project Description Form, 9-1241 (Exhibit 1). At this time, if it is deemed practicable and in accord with the programs of the Geologic or Water Resources Divisions, consideration will be given to coordinating the project with the programs of these divisions by joint participation with the objective of producing a "general geologic map" as defined by the Geologic Division (BMC Handbook, Chap. III, Geologic Map Standards).

Upon the completion of the field investigation, compilation of the maps, the organized assemblage of the field data required for classification, and the preparation of township maps and reports, the accumulated data will be referred to the Committee for Land Classification to initiate classification procedures. (Part 611.5.2, this manual).

The primary objective of all Branch of Mineral Classification geologic field projects is the acquisition of data essential to scientific land classification which is not otherwise available. Geologic mapping,

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Chapter 5 Classification - Procedures

611.5.1B

compilation of maps, and the preparation of reports are to be conducted in accordance with prescribed standards and techniques. (BMC Handbook, Chap. III, IV; USGS Bull. 537, "Classification of the Public Lands; USGS "Suggestions to Authors"; "Preparation of Illustrations"; GPO "Style Manual".)

When a reasonable justification is indicated for the publication of the results of a geologic examination or investigation either as a map or report of the Geological Survey's official publication series, planning will provide for the required personnel, time, and funds. This may result in a complete product by the Branch of Mineral Classification alone or a participating project with either the Geologic or Water Resources Division, or both.

For all uncompleted projects "Work Plan and Accomplishment" forms 9-1294, are to be submitted to the Branch Chief, not later than May 1 of each year (Exhibit 2). Upon the completion of each project, a project summary report will be submitted to the Branch Chief (Exhibit 3).

- B. Maps and Reports. In all cases geologic maps and reports shall be prepared as an end product of each mapping assignment or project, copies of which shall be placed in the Record Data File of the Washington office. Maps and reports designed for publication shall be prepared in conformity with prescribed Geological Survey standards and techniques (Part 619.2.3, this manual).

.2 Mineral Land Classification

A. Committee Action (Field or Headquarters).

- (1) Study of Field Data. When the field data have been compiled, they will be referred to a committee. The Regional Geologist or the acting Regional Geologist serving as chairman and the geologist and/or geologists assigned to the mapping project as members shall constitute the field committee of the Mineral Land Classification Board (Part 611.3.8, this manual). This group will initiate the classification procedures and will by applying the approved classification standards for the mineral involved determine whether the mineral content of the lands under consideration meet the minimum classification standards. (Part 611.4.1, this manual, USGS Bull. 537).

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611.5.2A(2)

(2) Preparation of Classification Minutes. The conclusions of the committee shall be recorded as minutes of the Mineral Land Classification Board (Exhibit 4) and these minutes shall contain a detailed account of the basis of the classification and the data indicated in the following outline:

(a) Introduction. Discuss the general area involved in the classification; mention the withdrawals, classifications, and restorations with dates; and include the publications and reports used as a basis for the current classification.

(b) Resume of the General Geology of Area.

Areal geology

Stratigraphy

Structure

Mineral occurrences:

Number

Thickness

Depths

Quality - For coal give heating value (Btu), as-received basis. For sodium, potassium, phosphate, and sulfur give percentage of NaCl, Na₂CO₃, K₂O, P₂O₅, or S, etc. For oil shale give gallons of shale oil per ton.

(c) Classification by Individual Township.

Summarize the geology of each township.

Cite withdrawal affecting the lands.

Discuss the stratigraphy pertinent to the mineral occurrence.

Describe the lands classified as mineral, nonmineral, or reported as prospective by legal subdivisions (40 acres, tract, lot, etc.).

Recommend that lands be restored or, as provided in Part 611.6.2 of this manual, that the withdrawal be continued or extended.

The discussion of the geology of each township intended for publication should not be duplicated in the minutes for that township. The minutes should give the geologic reasons or basis for the classification made and should provide sufficient justification to support legally the mineral or nonmineral classification reported to the Bureau of Land Management and to the public.

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611.5.2A(3)

- (3) Submittal of Minutes. When this action is approved by the Committee, the original and 2 copies of the minutes (all bearing the signatures of the members) shall be referred to the Chairman, Mineral Land Classification Board for review and approval.

An illustration (Exhibit 4) of the accepted format for the minutes follows.

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611.5.2B

B. Board Action.

- (1) Before submitting the classification order to the Director for approval, the Chief or Acting Chief, Branch of Mineral Classification, presiding as chairman and Branch staff geologists as members of the Mineral Land Classification Board will review the Minutes submitted by the Committee in a final determination as to whether or not the mineral content of the land meets the minimum classification criteria. If judged that the recommended classification meets such standards, the Minutes will be formally approved by the chairman and all members. If any question arises as to complete acceptance, the Minutes with appropriate written comments will be returned to the Committee for reconsideration.

.3 Formal Classification Action. After the Minutes prepared by the Committee have been approved by the Board, a Branch staff geologist will be assigned the responsibility of the preparation, distribution, and publication of the Land Classification Plats and Orders.

A. Classification Orders. Classification orders for publication in the Federal Register are prepared for the signature of the Director and will show (Exhibit 5):

- (1) The authority or authorities under which the order is issued.
- (2) The purpose of the order and the action taken.
- (3) The legal description of the land involved.
- (4) The date approved and signed.

B. Land Classification Plats. Plats showing graphically the formal classification of the land as mineral or nonmineral according to approved criteria for leasable minerals are prepared following approval of the classification order by the Director. These are drawn as individual township plats at the scale of one inch to the mile in the format shown in Exhibits 6 and 7.

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611.5.3C

- C. Approval of the Director. Classification orders are submitted to the Director for his approval with a covering memorandum (Exhibit 8). Two copies of the order must be certified as true copies of the original by the Certifying Officer, a designated member of the Director's staff. After approval, one copy of the memorandum is placed in the Division file and one copy of the memorandum is filed with a certified copy of the Classification Order in the Branch file after the order is returned from the Federal Register.
- D. Publication in Federal Register. Pursuant to Chapter 1, Title 1, CFR, the original and two certified copies of the Classification Order will be transmitted to the Director, Office of the Federal Register for publication in the Federal Register. (See Departmental Manual, Part 303). After publication in the Federal Register, the date of publication, the volume, and page number of the notice shall be noted on the certified Branch file copy and on the classification plat. A file containing clippings of the notice in the Federal Register or a facsimile copy shall also be maintained.
- E. Distribution of Classification Plats. When the original plat has been approved, it will be reproduced in Washington and copies distributed in the following manner:
- | | |
|--|---------------|
| (1) Regional Geologist, Denver, (plus others when appropriate) | 1 copy |
| (2) District Geologist (when applicable) | 1 copy |
| (3) Regional Mining Supervisor | 1 copy |
| (4) Branch Files | |
| (a) Record Data File | 1 copy |
| (b) Township looseleaf binder | Original plat |

PROJECT NUMBER:

B H:

DATE:

U. S. GEOLOGICAL SURVEY Exhibit 1
PROGRAM INDEX Part 611
PROJECT DESCRIPTION, PAGE 1 Chapter 5
(4 pages)
FORM 9-1241
(REV. JAN. 1960)

PROJECT TITLE:

PROPOSED STARTING DATE:

PROJECT CHIEF:

ESTIMATED DATE COMPLETION OF FIELD WORK:

OFFICE HEADQUARTERS OF PROJECT CHIEF:

ESTIMATED DATE COMPLETION OF REPORTS:

OBJECTIVES: (E. g., Geologic mapping (cite type and purposes); topical studies; resource investigations (cite commodities); devising or revising geologic or other techniques.)

PREPARED BY:

METHODS OF STUDY:

PROJECT DESCRIPTION, PAGE 2

Part 611

Exhibit 1 (Cont.), Chapter 5

PROJECT LOCATION: (State and county or other description; furnish quadrangle names if pertinent; sketch or shade in area of project; add latitude and longitude. Do not use townships and ranges.)

PRINCIPAL MAPPING SCALES:

REASONS FOR ADOPTING THESE SCALES:

PRINCIPAL COMPILATION SCALES:

PRINCIPAL PUBLICATION SCALES:

BASE MAPS, EQUIPMENT, AND OTHER FACILITIES:

What base maps are available (cite kind and edition):

Additional base map needs, if any:

Are equipment, office, and laboratory facilities available?

Additional equipment and facilities needed, if any:

PARTICIPATION BY OTHER UNITS (Division, Branch, Section, etc.) OF THE GEOLOGICAL SURVEY: (Cite units concerned, outline the nature and estimate the amount of the support that will be required from each):

U. S. GEOLOGICAL SURVEY
PROJECT DESCRIPTION, PAGE 3

PROJECT NUMBER:

DESCRIPTION: (Consider such things as why this particular job should be undertaken; its timeliness with respect to other work planned or in progress in your Branch; its feasibility; manner in which the proposed work will dovetail with and support the work of the Branch, of other units of the Survey, or of outside organizations.)

Exhibit 1 (Cont.)
Part 611, Chapter 5

PREPARED BY:

PLANS FOR PUBLICATION:

Professional Paper	Oil and Gas Map (OM)	Geophysical Inv. (GP)
Bulletin	Oil and Gas Chart (OC)	Technical Journals:
Geol. Quad. Map (GQ)	Coal Map (C)
Misc. Inv. Map (MI)	Mineral Inv.-Field (MF)
Circular	Min. Inv.-Resources (MR)

COOPERATIVE ARRANGEMENTS WITH OUTSIDE ORGANIZATIONS (cite funds, facilities, and other support to be contributed by each):

PROJECT NUMBER:

U. S. GEOLOGICAL SURVEY

Exhibit 1 (Cont.)

Part 611, Chapter 5

PROJECT DESCRIPTION, PAGE 4

ING PLANS:

Man Years

If any member of staff to be assigned has unfulfilled commitments to another project, what are they, and how are they to be resolved?

19 19

Professional

Other

CLASSIFICATION OF THE PROJECT IN TERMS OF BUDGET STRUCTURE:

Sub-Activity

Item

Of general application ☐

(To be used only in case the project cannot be coded in terms of the Sub-Activity and item breakdown given on the Time and Attendance Report.)

PREPARED BY:

FINANCIAL PLANS: What appropriations or funds are to be charged (include repay and cooperative funds and estimate percent)?

Appropriations or funds

Percent

Estimate the cost at *Branch* level, of the entire project and give financial plan for the first 2 years of operation.

Total estimated cost, Branch level, entire project	\$	19	19
Funding plans, Branch level, first 2 years			
Salaries, travel, and supplies	\$		\$
Special equipment and other capital outlay	\$		\$
Total estimate per year	\$		\$

Recommended by

Branch Chief

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Exhibit 2, Part 611
Chapter 5 (4 pages)

WORK PLAN AND ACCOMPLISHMENTS

1. Project No. _____ Title _____ State _____

Project Chief _____ Form prepared by _____ Date _____

2. FY started _____ 3. Project area _____ sq. mi.

FY field work completed _____ Area mapped thru 6-30-62 (total) _____ Scale 1:

FY final report completed _____ Area mapped in FY 1963. _____ Scale 1:

4. Progress in mapping:

Sketch information requested below; add latitude and longitude. Please use $7\frac{1}{2}'$, 15', 30', or whole degree quadrangles, and furnish in boxes the key to identify symbols used. For projects which do not involve areal mapping, only the outline of the project is needed.

(Indicate names of quadrangles)



a. Outline entire area of authorized project and also indicate changes, if any, proposed in item 8.



b. Indicate area mapped from beginning of project to June 30, 1962.



c. Indicate area mapped and to be mapped during fiscal year July 1, 1962 thru June 30, 1963.



d. Indicate area to be mapped July 1, 1963 thru June 30, 1964.

_____ e. Give percent of area mapped from beginning of project. Include area to be mapped to June 30, 1963. (i.e., b plus c above)

f. Type of base map used for compilation (if topographic map used, give scale and edition):

g. If subsurface, underground, or geophysical mapping has been done, indicate type and amount: _____

5. Plans for FY 1964:

6. Results, FY 1963, with emphasis on scientific and economic findings:

7. Summary of results thru FY 1962; don't cite publications, but do emphasize scientific and economic findings:

8. Changes in plan of project that may substantially alter the objectives, timing, or costs:

9. Publications (*state publication form and scale of publication of maps*). If any publications listed here should be credited wholly or partly to another project, please so indicate.
- a. Reports in preparation (*show author, approximate title and estimated date of submittal to Branch*).

b. Reports submitted to Branch but not yet published (*give title and proposed form of publication*).

c. Reports published since submittal of last Work Plan and Accomplishment Report (*Give title and form of publication*).

10. Professional personnel assigned to project FY 1963:

	NAME	MAN MONTHS WORK ON THIS PROJECT, FY 1963
Project Chief		
Others		

11. Branch Chief's Comments:

12. STATEMENT OF SCIENTIFIC AND ECONOMIC RESULTS FOR
USE IN PREPARING VOLUME A OF 1963 ANNUAL REVIEW

Code _____

Name(s) _____ Division _____ Branch _____

Official address _____

Project No. and Title _____

Summary of most important or most interesting scientific and economic finding or conclusion reached as a result of recent work on project. (See Prof. Papers 400-A, 424-A, and 450-A for type of material desired.)

Status of report containing this finding or conclusion (*check one*):

_____ Published or scheduled for publication in fiscal year '1963.

_____ Written or being written for short papers volumes of 1963 Annual Review.

_____ Manuscript report in the mill. If so, give current status or estimated date of publication _____

_____ Manuscript in preparation.

_____ Not yet in report stage.

Reference to report or reports containing finding or conclusion. Please place in standard Survey style.
Initial to certify accuracy.

PROJECT SUMMARY

No. Name

Project Chief..... 19.....to 19.....

.....19.....to 19.....

.....19.....to 19.....

Project history—give month and calendar year

Project approved.....Started.....Field work completed.....

Recessed.....To be resumed.....Resumed.....

Final report completed by author.....Final report published.....

Project accomplishments (include both summaries of the chief additions to scientific knowledge (direct or by-product) and practical accomplishments or discoveries, such as would be of interest in budget justifications. Attach additional sheet if needed).

Professional Personnel—give name and dates on project

Project costs and man years, field level, (include professional, subprofessional and clerical man years):

Fiscal Year	SIR (GS)	Other	Identify	Man-years	Remarks
19.....	\$	\$
19.....	\$	\$
19.....	\$	\$
19.....	\$	\$
19.....	\$	\$

Cooperative with.....Extent of coop.

No. square miles mapped.....Scale.....Amt. subsurface mapping.....

Give information of special interest on reverse side (special services, logistic support, etc.).

Approved by, Branch Chief

(State) (mineral) Land Classification Minutes No. 1/

Minutes of the Mineral Land Classification Board 2/

Date:

Subject: (Mineral) classification (area or township)

Classification Committee Present: (Include geologists and Regional Geologist participating in the investigation)

In consultation: (Include engineers of Branch of Mining Operations or other Geological Survey personnel who may have participated)

Text and figures as shown in BMC Handbook, Chapter V, pages 107-119, inclusive.

Submitted and recommended by the Committee:

(Geologist) Member

(Geologist) Member

Minutes by:
(Author's name)

(Regional Geologist) Chairman

Reviewed by: _____ 3/ Date: _____

Approved by Mineral Land Classification Board:

(Geologist) Member

(Geologist) Member

(Branch Chief) Chairman

Date:

- 1/ This file number will be assigned in Washington office in one numerical sequence, excluding overall standards (unnumbered), but a separate series for each state and mineral.
- 2/ These minutes are incomplete and not a true copy of any set of minutes but a composite to illustrate the form to be used.
- 2/ Review to be by Washington office unless otherwise specified.

UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey
Washington 25, D. C.

Coal Land Classification Order Montana No. 32

Pursuant to authority under the Act of March 3, 1879 (20 Stat. 394; 43 U.S.C. 31), and as delegated to me by Departmental Order 2563, May 2, 1950, under authority of Reorganization Plan No. 3 of 1950 (64 Stat. 1262), the following described lands, insofar as title thereto remains in the United States, are hereby classified as shown:

(Complete land description by legal subdivision,
40 acres, tract, lot, etc.)

The area described aggregates _____ acres, more or less.

Director

Date

(on copies only:)

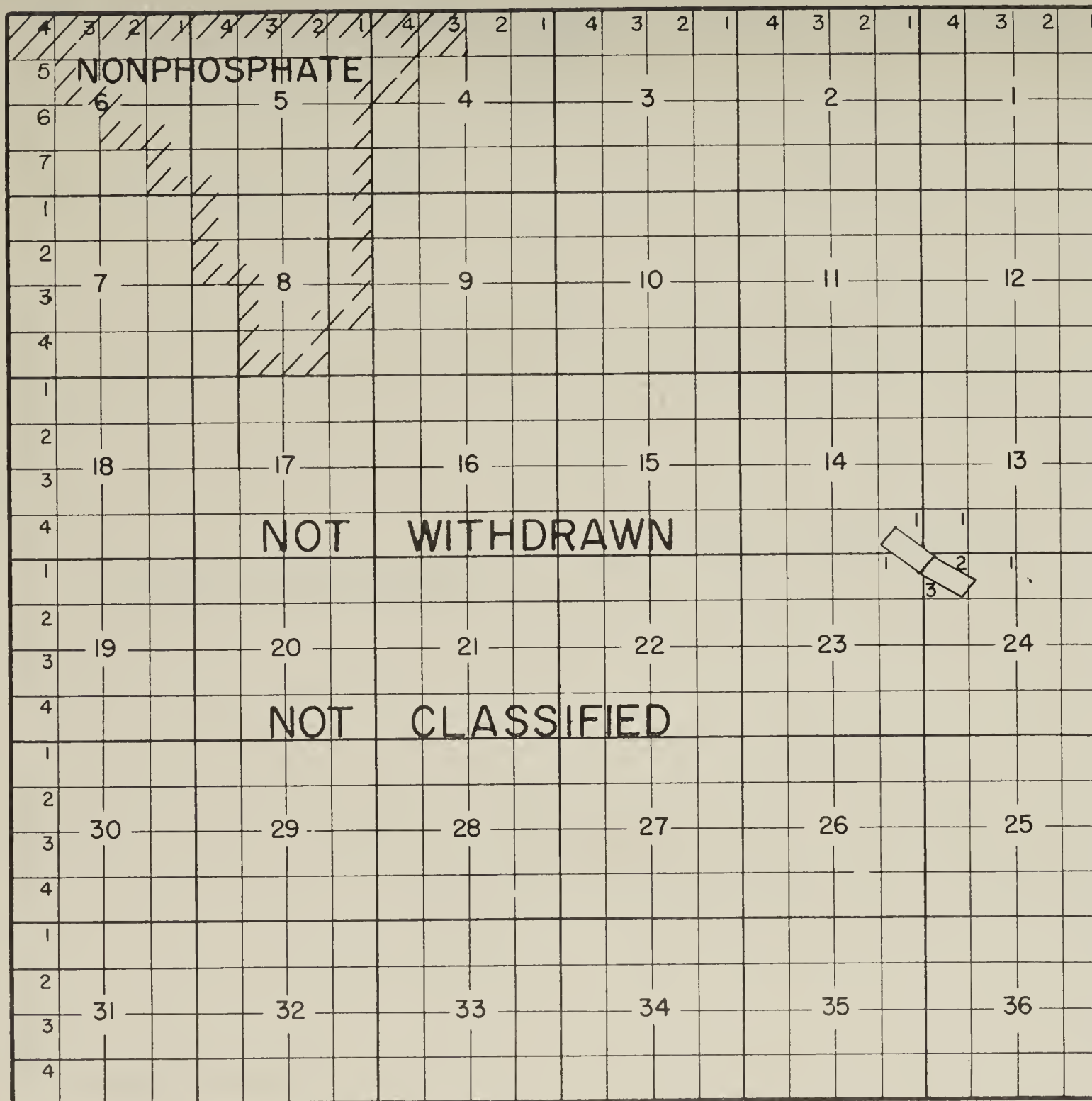
Certified to be a true copy
of the original

Certifying Officer

(Original and 2 certified copies transmitted to Director, Office of the Federal Register, 1 certified copy returned for Branch file to be annotated with the date of publication in the Federal Register, the volume and page number.)

T. 9 N., R. 2 E., S.L.M., UTAH

PHOSPHATE






CLASSIFIED	Mineral	Nonmineral
Classified by this action		1,681
Reclassified by this action		
Prior classification		
Total acres classified to date		1,681

NOT CLASSIFIED	
Not withdrawn	21,367
In outstanding withdrawal	
Restored without classification	
Total acres not classified	21,367

Total acres in township 23,048

Classified on dates shown as:

Mineral 
 Nonmineral 
 Not classified 

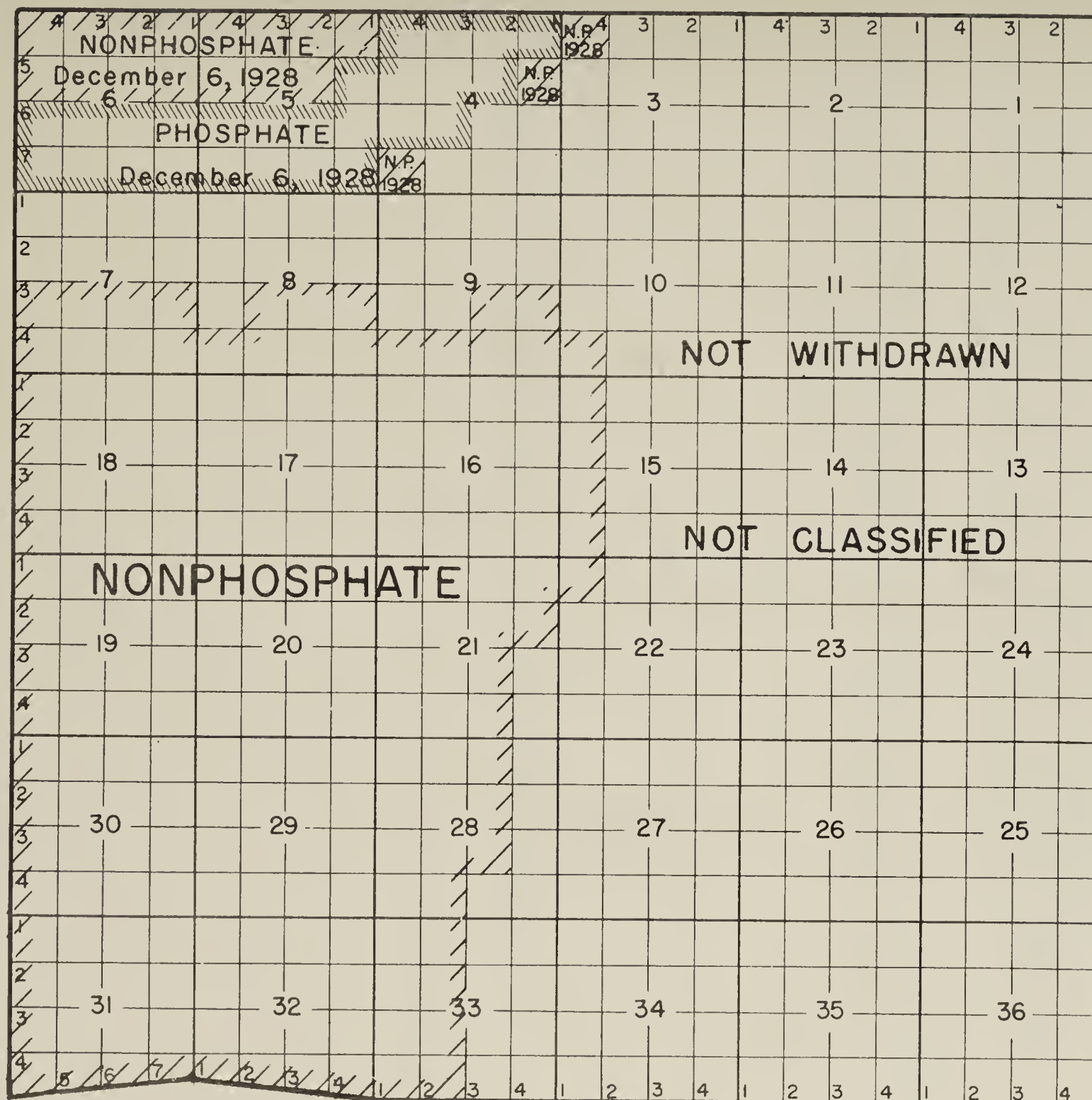
New classification approved by the Director,
 U. S. Geological Survey, June 29, 1961, ,
 published in Federal Register v. 26 , p. 6111 ,
 July 7, 1961

Restored from Phosphate Reserve No. 27,
 Utah No. 4 , by Public Land Order 2488,
 published in Federal Register v. 26 , p. 8640,
 September 15, 1961

Exhibit 6
 Part 611, Chapter 5

T. 10 N., R. 2 E., S.L.M., UTAH

PHOSPHATE






CLASSIFIED	Mineral	Nonmineral
Classified by this action		8,122
Reclassified by this action		
Prior classification	1,054	753
Total acres classified to date	1,054	8,875

NOT CLASSIFIED	
Not withdrawn	13,091
In outstanding withdrawal	
Restored without classification	
Total acres not classified	13,091

Total acres in township 23,020

Classified on dates shown as:

Mineral 
 Nonmineral 
 Not classified 

New classification approved by the Director, U.S. Geological Survey, June 29, 1961, published in Federal Register v. 26, p. 6111, July 7, 1961

Restored from Phosphate Reserve No.27, Utah No.4, by Public Land Order 2488, published in Federal Register v. 26, p. 8640, September 15, 1961

Exhibit 7
Part 611, Chapter 5



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

Exhibit 8
Part 611, Chapter 5

Memorandum

To: Director, Geological Survey

From: Chief, Conservation Division

Subject: ..(Mineral).. Land Classification Order ...(State)...(No.)

The enclosed order of classification affects lands in County,(State)....., which are in(Mineral) Withdrawal No.,(date)....., (or which were previously classified.) The lands have been examined by geologists of this division and (were not) found to contain deposits of classifiable character.

The order has been prepared for publication in the Federal Register and your approval is recommended. The first two copies of the order are to be certified and returned with the original to this division for transmittal.

Chief, Conservation Division

Enclosure

(One copy filed in Division file, GS-664, and one copy in Branch files with a certified copy of the Classification Order).

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
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Branch Program Series

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Chapter 6 Restoration or Retention of Withdrawal

611.6.1

- .1 Restoration. After approval of the Classification Order, if it is the judgment of the Mineral Land Classification Board that the purpose of the withdrawal has been fulfilled, the Director, Bureau of Land Management will be notified (Exhibit 1).
- .2 Retention. Should the findings of the Mineral Land Classification Committee and Board indicate that there are insufficient data to classify the land as mineral or nonmineral, the withdrawal should be retained or the land restored without classification and reported as valuable prospectively.



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

Exhibit 1
Part 611, Chapter 6

Date.....

Memorandum

To: Director, Bureau of Land Management

From: Acting Director, Geological Survey

Subject: Transmitting copy (copies) of Mineral Land Classification Order(s)

A copy is (copies are) enclosed of(mineral)....Land Classification Order(s)(State).... No.(s) The lands in(order number or other description).... are in Executive Order(mineral)..... Withdrawal (or Reserve) No.....(State).... No....., approved (date). (Additional wording as necessary to cover more than one withdrawal or other variations.)

This (these) Classification Order(s) was (were) published in the Federal Register as follows:

(Order No.)	(FR date, volume, and page)
-------------	-----------------------------

The completion of this classification by the Geological Survey provides a basis for the restoration of the specific lands listed in these transmitted orders from the withdrawal(s) reserve(s) by appropriate public land order.

Acting Director

Enclosures

Copy to: GS General
Regional Geologist, Denver, Colo.
Regional Geologist,(if appropriate)
District Geologist,(if appropriate)
Manager, Land Office,
Director's chron.
Conservation Division (GS-664)
BMC Withdrawal

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
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Part 612 Informal Classifications - Federal Land

Chapter 1 Authority

612.1.1

Informal classifications are actions performed by the Washington staff of the Branch of Mineral Classification involving applications for the surface use of public lands. Also included are prospectively valuable determinations by the Classification Committees and Board either on specified areas or on a regional basis supported by geologic data. The determinations made by the Branch require reports on the mineral and water resources of specified tracts of land subject to disposal for surface use under authority of a series of Public Land Laws governing the disposal of lands in the Public Domain for various purposes. Such actions by the Branch are termed "co-ops" as their handling originated under an agreement between the Geological Survey and the old General Land Office (now Bureau of Land Management) dated July 9, 1910, for the cooperative handling of these cases. There has been a number of subsequent revisions and these are listed under 612.1.2.

.1 Statutory. The following cited legislative actions are the principal acts governing settlement or entry on the public domain providing for or which to some degree affect surface entries such as homestead, desert land entries, entries under the reclamation and grazing acts, and the sale of isolated tracts:

- A. May 20, 1862 (Rev. Stat. 2289-2303) Homestead Law (12 Stat. 392)
- July 9, 1870 (16 Stat. 217) Placer Law
- May 10, 1872 (Rev. Stat. 2319) Mining Law (17 Stat. 91)
- March 3, 1877 (19 Stat. 377) Desert Land Entries
- March 3, 1879 (20 Stat. 377, 394) The "Organic Act" of the
Geological Survey
- June 17, 1902 (32 Stat. 388) Reclamation Act
- March 27, 1906 (34 Stat. 88) Authorized the Secretary of the Interior
to reclassify public lands in Alabama
- June 11, 1906 (34 Stat. 233) Surface entry on forest reserve land
- March 3, 1909 (35 Stat. 844) Agricultural entries on coal land
- June 22, 1910 (36 Stat. 583) Separation Act
- June 25, 1910 (36 Stat. 847) Withdrawal Act
- April 30, 1912 (37 Stat. 105) Separation Act
- July 17, 1914 (38 Stat. 509) Agricultural entries on mineral land
- June 28, 1934 (48 Stat. 1269) Taylor Grazing Act
- May 16, 1946 (60 Stat. 1099) Reorganization Plan No. 3
Creation of Bureau of Land Management
- July 31, 1947 (61 Stat. 681) Materials Act
- May 24, 1950 (64 Stat. 1262) as amended July 25, 1952; Reorganization
Plan No. 3 of 1950. Reorganization Plan
No. 3 (64 Stat. 1262) transfers to the
Secretary of the Interior all functions
of other offices of the Department.
- August 13, 1954 (68 Stat. 700) Multiple Use Act
- July 7, 1958 (72 Stat. 339) Alaska Statehood Act
- August 27, 1958 (72 Stat. 928) State Indemnity selections

Department of the Interior
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Branch Program Series Part 612 Informal Classifications - Federal Land

Chapter 1 Authority

612.1.2

- .2 Delegated. The Departmental, Bureau, and Division orders, regulations, or manuals contain delegations of authority under which the Branch of Mineral Classification is charged with the duties relating to the mineral land classification of the public domain. Some of the more important follow:
- A. July 9, 1910, agreement between Geological Survey and General Land Office provided that the Survey furnish a report in each land entry where lands withdrawn or classified as coal lands are involved.
 - B. January 11, 1912, Departmental Order, required the Survey to furnish a report on all railroad and State indemnity selections.
 - C. January 18, 1912, Departmental Order, supplemental order to January 11, 1912, required a report from the Survey on selections, applications, and filings not specifically excepted from reservation by Act of June 25, 1910 (36 Stat. 847), and under which a vested right has not been secured.
 - D. March 5, 1912, cooperative agreement between the Land Office and the Survey in regard to lands withdrawn or classified as valuable for coal, oil, phosphate, and power site and reservoir withdrawals.
 - E. February 12, 1917, cooperative agreement of March 5, 1912, extended and water holes included.
 - F. May 27, 1942, agreement approved by the Secretary that a report will be obtained by the Land Office on mineral and water power resources of land before action is taken on any application to locate, enter, select, or purchase.
 - G. May 2, 1950, Departmental Order No. 2563. Each function transferred to Secretary of Interior by Sec. 1 of Reorganization Plan No. 3 of 1950 is assigned to the officer, employee, or agency from which it was transferred.
 - H. Geological Survey Manual, Organization Series. Part 120.4.1D, October 20, 1959 (Release No. 310), assigns to the Branch of Mineral Classification the task of mineral classification of "Federally-owned land".
 - I. Departmental Manual. Public Land Series, Part 603.1.2C, Land Withdrawal Program, June 11, 1960 (Release No. 290), designates to the Geological Survey primary responsibility for mineral and water power classification.
 - J. Bureau of Land Management Manual, Vol. V., Lands, Parts 2 and 2A, and Vol. VI, Minerals.

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series

Part 612 Informal Classifications - Federal Land

Chapter 2 Land Disposal

612.2.1

The Public Land Laws provide for disposal of the public lands through many kinds of entries or selections. As expressed in the Bureau of Land Management Manual, Vol. V., Chapter 1.12.1:

"In connection with every land-disposal case involving laws which do not automatically require the reservation of all minerals to the United States the adjudicating officer will request a mineral and water resource report from the Geological Survey."

In further reference to Geological Survey reports, quoting from Vol. VI., BLM Manual, Chapter 5.1.5, the following procedure is used.

- "A. The U. S. Geological Survey reports as to locatable minerals is (are) advisory only, and the BLM has final authority and responsibility for determining mineral character for locatable minerals.
- "B. The U. S. Geological Survey reports on the value of lands for leasable minerals govern certain actions to be taken by the land office manager in the adjudication process. The mineral examiner making a mineral classification of the land must accept the U. S. Geological Survey's conclusions as to leasable minerals. He is, however, not precluded from reporting findings which he believes were not fully considered by the Geological Survey, so that in exceptional instances the State Supervisor may request a supplemental report from the Geological Survey." (Underscoring supplied.)

Regulations governing the various forms of land disposal are found in 43 CFR Chapter 1, Bureau of Land Management, Subchapter A-Alaska and Subchapters B through W.

- .1 Nonmineral Entries. Applications, entries, and selections filed with the Bureau of Land Management are referred to the Washington office of the Geological Survey for a report on the mineral and waterpower resources of the land involved. The Washington office of the Branch of Mineral Classification checks the records on the lands included in the applications to make a mineral determination and they are then forwarded to the Branch of Waterpower Classification for a report on the dam and reservoir sites. The Branch of Mineral Classification then prepares the appropriate reports to the Manager of the Land Office.

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Chapter 2 Land Disposal

612.2.1A

In preparing each report the Mineral Classification geologist will refer to all of the data available in the Record Data files (see Part 619, Chap. 1, this manual) including classification cards and plats; classification and determination maps; the known geologic structure definitions; valuable prospectively mineral and mineral occurrence maps and cards; and Geological Survey, State, and other publications on file in the Branch and the Survey library. On occasion when critical information is lacking as to the presence of leasable minerals in particular, the regional offices are requested to furnish a report on the mineral resources relating to the lands involved.

- A. Without Value for Mineral. When the findings determine that the land is without value for mineral, either leasable or locatable, and it is not withdrawn for waterpower or storage purposes, the serial register sheet from the Bureau of Land Management is stamped in the following manner:

Date

The Director
Bureau of Land Management

Survey information indicates that this
land is without value for mineral, either
metalliferous or nonmetalliferous.

The land is not withdrawn for waterpower
or storage purposes.

(Sgd) Chief, Branch of Mineral Classification
or designated alternate

For the Director
Geological Survey

- B. Valuable Prospectively for a Leasable Mineral. When it is determined that the land is valuable prospectively for any of the leasable minerals and is without value for other minerals, and is not withdrawn for waterpower or storage purposes, the following is stamped on the serial register sheet:

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612.2.1C

Date

The Director
Bureau of Land Management

Survey information indicates that this land is valuable prospectively for (leasable mineral), that it is without value for other minerals either metalliferous or nonmetalliferous, and that the exercise of surface rights thereon would not interfere unreasonably with operations under the mineral leasing laws.

The land is not withdrawn for waterpower or storage purposes.

(Sgd; Chief, Branch of Mineral Classification
or designated alternate)

For the Director
Geological Survey

On the basis of this report the Bureau of Land Management would require a reservation of the mineral rights to the United States for the mineral(s) designated before approving the application.

- C. Indicated Valuable for Locatable Minerals. When the available information indicates the possibility of occurrences of locatable minerals, the Land Office is so advised with a reference made to the publications used in arriving at this conclusion. Exhibit 1 is a type of form letter used in such reports and varies by modification as to whether or not the land is valuable prospectively for a leasable mineral and/or a waterpower withdrawal is in effect. On rare occasions where available evidence is conclusive that a valuable deposit of a mineral exists a definite statement to this effect is used. If the field examiner of the Bureau of Land Management subsequently determines that there is conclusive evidence of the presence of a mineral deposit, the application for surface entry will be rejected or modified. Occasionally, a supplementary report is requested.

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612.2.1D

- D. Combinations and Special Circumstances. Occasionally, it is necessary to combine the essence of A, B, and C types of reports into one reply, dependent on the determination for the land involved. In such instances a typed or form-letter reply will be used, as appropriate. Rubber-stamped replies are not always made under A and B types of cases, dependent on circumstances such as a special problem on ownership, or the occasional mention of common mineral varieties that are actively being developed, or the presence of quarries.
- E. Interference With Operations Under the Mineral Leasing Laws. When lands are determined to be valuable for any of the leasable minerals such as being within a known geologic structure, or within an area classified as mineral land, or within an area withdrawn because of indicated mineral value, it is necessary to determine whether or not the exercise of the surface rights would unreasonably interfere with operations under the mineral leasing laws (47 Stat. 1670).

When such conditions are indicated, the Branch of Mineral Classification refers the application to the Branch of Oil and Gas Operations if a known geologic structure is involved, and to the Branch of Mining Operations regarding the other leasable minerals. If it is believed surface rights would so interfere, the following statement is included in the report:

". . . that the exercise of surface rights would interfere unreasonably with operations under the mineral leasing laws."

An explanation as to why it would interfere is also included.

Upon receiving such a report from the Geological Survey, the Bureau of Land Management will reject the application for a surface entry.

If it is not believed that the surface entry would interfere with the mineral leasing operations, it is so reported and the application may be approved.

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612.2.1F

- F. Burden of Proof. When a request for a mineral report shows a filing of satisfactory proof has been made for lands entered under the nonmineral laws prior to a Geological Survey _____ report, the claimant is entitled to a patent without reservation unless the Government is prepared to assume the burden of proving, prima facie, that the land was known to be of mineral character at the date of acceptable final proof or when the claim was completed (43 CFR, Parts 102.4, 102.22, and 102.29). In such cases the Geological Survey will state in the mineral report whether or not the Government is prepared to assume the "burden of proof."

When the Geological Survey reports before the filing of satisfactory proof that the land embraced in the nonmineral entry is mineral in character, the burden of proof will be upon the claimant if he avails himself of the right to protest such findings (43 CFR, Part 102.3, 102.28). If no protest is filed or in the event of protest and failure by the claimant to establish that the classification of the land as mineral in character is erroneous, the patent may issue with a reservation of the mineral rights to the United States.

- G. Color of Title. Qualified claimants may obtain patents on public lands by purchase (43 CFR, Part 140) upon establishing the validity of the claim. Geological Survey reports on these cases differ slightly in consideration from those in other disposal cases, as the claimant may or may not elect to receive a patent conveying title to the minerals except (43 CFR, Part 140.8): (1) for lands embraced in an outstanding mineral lease; or (2) for lands placed in a mineral withdrawal. If the land is considered to be mineral in character this will be reflected in its fair market value at the time of appraisal (by the Bureau of Land Management). The Survey will only report as to whether the lands are within a mineral and/or waterpower withdrawal or are valuable or valuable prospectively for either leasable or locatable minerals.

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612.2.2

- .2 Mineral Entries. Rights to mineral lands, excluding the leasable minerals, are initiated by prospecting for minerals thereon, and upon the discovery of a valuable deposit of mineral, the claimant may obtain a patent on the land within the mineral claim (43 CFR, Part 185). Mining claims are of two distinct classes; lode claims and placers. However, the role of the Geological Survey in reporting to the Bureau of Land Management on patent applications of mining claims is to determine whether the lands are "known to be valuable for minerals subject to disposition under the mineral leasing laws." The Multiple Use Act of August 13, 1954 (68 Stat. 708), provides that a reservation of leasable minerals to the United States will be made in issuing patents under the mining laws when the lands are determined to be valuable or valuable prospectively for any such minerals. The Bureau of Land Management determines the sufficiency of the discovery of locatable minerals present as a basis for issuance of a mineral patent for that mineral.



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

IN REPLY REFER TO:

Exhibit 1
Part 612, Chapter 2

Memorandum

To: Manager, Land Office,
From: Director, Geological Survey
Subject:

Your request for a mineral and water resources report on the subject application was received on
Lands applied for therein are situated in:

Geological Survey information indicates that the land applied for is without value for any Leasing Act mineral. However,

Survey information as to mineral occurrence of the non-Leasing Act minerals mentioned above is inconclusive. Examination by your field service is recommended to determine, within the meaning of the public land laws, the mineral character of this land.

The following publications contain information on mineral occurrence on or near this land:

The land is not withdrawn for waterpower or storage purposes.

For the Director

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613.3.1

.1 Known Geologic Structure. Section 32 of the Mineral Leasing Act provides that the Secretary of the Interior is authorized "to fix and determine the boundary lines of any structure, or oil or gas field." This authority is delegated to the Director, Geological Survey (43 CFR 192.6(a)) and the responsibility of performing this function is assigned to the Branch of Mineral Classification (Geological Survey Manual, Part 120.4.10). Structure determinations may be formal in character, administratively termed "structures defined", and are consummated by the filing of maps or diagrams with the appropriate office of the Bureau of Land Management and by publication of notice in the Federal Register (43 CFR 192.6(b)). Day-to-day determinations, "structures undefined", as an administrative expedient for appropriate action preliminary to the three regulatory actions that follow do not require the filing of maps, plats, or diagrams. These latter determinations, although informal administrative actions, have the same force and effect as the formally defined structure:

- (1) For distinguishing whether lands are subject to competitive or noncompetitive leasing under Section 17 of the Mineral Leasing Act and 43 CFR 192.40 and 192.50.
- (2) For appropriate application of the two-year and five-year lease extension provision of Section 17 of the Act and 43 CFR 192.120(e). As to the lands not within the known geologic structure of a producing oil or gas field; five-year noncompetitive leases are entitled to a single extension for a period of five years after expiration of the primary term. As to lands within a known geologic structure as of the expiration date of the primary term, the lease will be extended for a period of two years. The Act of September 2, 1960 (74 Stat. 781) provides for ten-year term leases without extension.
- (3) For appropriate application of the rental provisions of Section 17 of the Act and 43 CFR 192.80.

A. "Structure Defined". The boundaries of known geologic structures of producing oil and gas fields will be determined by the technical staff in the Washington office or in the field in either the appropriate regional or district office. In the field such actions may be carried out on the request of the Branch Chief or on the initiative of the field geologist.

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613.3.1A(1)

- (1) Definition. Administratively the "known geologic structure of a producing oil or gas field" is the area defined by the Director, Geological Survey under delegation by the Secretary of the Interior (43 CFR 192.6(a)).

Technically, it is the trap, whether structural or stratigraphic, in which an accumulation of oil or gas has been discovered by drilling and determined to be productive, the limits of which include all acreage that is presumptively productive (USGS Circular 419, 1959).

- (2) Procedure. Each formal definition of a "known geologic structure" will be justified by a written record of supporting evidence and the geologist or geologists preparing such actions for the approval of the Director will follow prescribed procedures.

- (a) Factors to be Considered. The well or wells that are considered to effect the definition of a new field or the modification of a previously defined field supply critical information particularly as to productive capacity, reservoir pressure, and other subsurface reservoir and geologic data that may have a direct influence on the determination of the boundaries of the "structure". The extent and position of any oil or gas deposit is influenced by structural and stratigraphic conditions and by reservoir characteristics such as the nature of the sedimentation, porosity, permeability, and hydraulic pressure. All of these factors will have effects in varying degrees on the areal extent of the accumulation. All such evidence that is available shall be applied. The "known geologic structure", either defined or undefined, should embrace the acreage that information available at the time of definition indicates may be presumptively productive within the limits of that particular trap.

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613.3.1A(2)(b)

- (b) Effective Date. The effective date which appears on the "known geologic structure" plat is of paramount importance. This date has its effects on the administrative actions prescribed in 43 CFR 192.40, 192.20, 192.80, and 192.120, and enumerated in the first paragraph of this chapter. As a practical definition the "effective date" may be considered as the date of ascertainment of fact; that is, when the capacity to produce becomes known, or the date when available facts have been evaluated. The effective date of the newly defined field most often will be that of the completion date of the discovery well. The effective date of an addition to or modification of a defined structure most often will be the completion date of an extension well or the date that the evaluation of facts was made.
- (c) Promulgation Date. This date is no more or no less than the date on which the Director approved the plat showing graphically the limits of the known geologic structure. This date has no administrative significance as relating to leasing status, extension of leases, and rentals.
- (d) Duration of Defined Structure. Once the "known geologic structure" is defined, the definition remains in force and effect until it is revoked or terminated by administrative action approved by the Director, even after the productive zone is exhausted or incapable of producing in paying quantities. This is a matter of Departmental policy first expressed in an unreported decision (A-6287) of the First Assistant Secretary of March 24, 1924. This policy was reaffirmed in a decision of October 28, 1947 (60 I.D. 62) in which the Assistant Secretary stated:

"It is not the policy of the Department to redefine (revoke or terminate) a geologic structure until all sands or formations therein having prospective value for oil or gas have been exhausted or proven barren."

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613.3.1A(2)(e)

- (e) Known-Geologic-Structure Minutes. The factors considered in arriving at a determination of the boundaries of a known geologic structure shall be recorded as formal minutes to be prepared in the form shown in Exhibit 1. These minutes shall include a complete land description of the area to be included, the recommended effective date of the action, bear the signatures of all geologists involved in the considerations, and then be submitted to the Branch Chief for acceptance.
- (f) Known-Geologic-Structure Plats. After the proposed definition as prescribed in the minutes has been accepted by the Branch Chief, a plat will be prepared and submitted to the Director for approval. After approval, the plats will be reproduced for distribution and unless impractical the reproduction shall be 8" x 10 $\frac{1}{2}$ " in size in the form shown in Exhibits 2 and 3.
- (g) Distribution of Plats. Immediately following reproduction the known-geologic-structure plats will be distributed with a transmittal memorandum to the Manager of the appropriate Land Office and to the following offices in accordance with current instructions regarding distribution:

Manager of Land Office for State involved.
Oil and Gas Supervisor for States within the region involved.
Regional Geologist for States within region involved.
District Geologist.
Director, Bureau of Land Management (Minerals Staff Officer).

The Washington office of the Branch will maintain a looseleaf book alphabetically by field, and a plat for each township will be filed in the township record data file.

- (h) Publication in the Federal Register. Pursuant to Chapter 1, Title 1 CFR, the original and two certified copies of a notice listing the names of newly defined or revised known geologic structures, showing the effective dates and the total embraced acreage of each field, will be forwarded to the Director, Division of the Federal Register (Exhibit 4) for publication in the Federal Register. The code numbers for state designations are assigned alphabetically from 1 to 50.

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613.3.1B

B. "Structure Undefined". The "structure undefined" or the "undefined addition" to a known geologic structure are administrative determinations based upon the most recent available information. Such determinations are an administrative expedient made necessary in the fulfillment of the provisions of Sections 17 and 27 of the Mineral Leasing Act and 43 CFR 192.40, 192.50, 192.80, and 192.120 effecting leasing status, extension rights, and rentals in the Bureau of Land Management's administration of leases and lease offers. These determinations, made on a day-to-day basis depending on the acquisition of well and geologic data, are necessarily informal in character as time and the availability of information does not permit the preparation of formal actions. Although informal in character, the fixing of the boundaries of the known geologic structure "undefined" are based upon consideration of the same factors that control the boundaries of a "structure defined", and may be considered as a prelude to the formal definition. The "structure undefined" has the same force and effect as the "structure defined". The Department has consistently held that it is the date on which facts are available showing the lands to be on a producing structure and not the date of pronouncement to the public that is determinative (Charles A. Haupt, 48 L.D. 355 (December 12, 1921); H. E. Christensen, A-26221 (August 31, 1951); Ernest A. Hansen, A-26375 (May 29, 1952); John P. Dever, 67 I.D. 367 (October 4, 1960); USGS Circular 419, (1959)).

- (1) Definition. The "structure undefined" or the "undefined addition" to a known geologic structure is a determination fixing the boundaries of a known geologic structure of a producing oil or gas field without the formality of filing maps or diagrams in the Land Office and notice of such action being published in the Federal Register.
- (2) Procedure. The fixing of the boundaries of known geologic structures of producing oil or gas fields "undefined" varies only in formal detail from that of a "defined structure". Minutes recording the deliberations are not prepared, nor are maps and diagrams filed with the Land Office and notices of the action are not published in the Federal Register. However, the same factors that control the inclusion of acreage in the "structure defined" are applied in determining the acreage in the "structure undefined". The notable difference is that the evidence applied in determining the "structure undefined" generally relates to a single well or a few wells and geologic data may be indecisive.

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613.3.1B(2)(a)

- (a) Work Maps. Master work maps are maintained in the Washington office on which all defined and undefined structures are delineated. From all sources available information is plotted on these maps. These maps are derived from reports from the Regional and District Geologists, Regional Oil and Gas Supervisors, Individual Well Record sheets, commercial scouting reports, and trade periodicals. When administrative determinations are required, or information on the maps indicate that a new field or an addition to a field may be required, the appropriate Regional or District Geologist is expected to submit a report recommending the boundaries of the area that should be included in the known geologic structure and establishing the effective date of its inclusion. This determination when accepted will be recorded on the work map.
- (b) New Discoveries of Oil and Gas, IOG 38. Instructions to Oil and Gas Supervisors (IOG 38) dated March 22, 1938, and subsequently amended June 26, 1939; March 27, 1940; October 1, 1951; and October 23, 1951, provide instructions for the reporting of new discoveries of oil or gas. This report and an internal report of the Branch of Oil and Gas Operations - "First Production on Federal Leases", provides valuable first-hand information that may effect the leasing and rental status of Federal lands. Copies of these reports are transmitted to the Washington office of the Branch of Mineral Classification and to the appropriate Regional or District Geologist. In Washington the well is plotted on the work map. In the Regional or District office the report is reviewed. If it is deemed that the discovery or completion reported indicates that the discovery of a new field or of an extension of a field has been made, a report is submitted to the Branch Chief recommending the acreage to be included in the known geologic structure and the effective date to be considered. When approved by the Branch Chief this designation is delineated on the Washington office work maps. Should the Regional or District Geologist believe that there was sufficient reliable evidence available to justify a formal definition of a known geologic structure, he will prepare known-geologic-structure minutes as described in subparagraph .1(A)(2) of this chapter.

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613.3.1B(2)(c)

- (c) Effective Date. The effective date as applied to "structures undefined" will be based on the same criteria as that employed in the "structure defined". Generally, this date is the completion date of a discovery well or of the extension well that established that the structure or addition thereto was productive.

- C. First Discoveries of Oil or Gas - Report to Bureau of Land Management. When a determination is made that lands are to be included in a "structure undefined" or an "undefined addition" to a known geologic structure, a memorandum report will be sent by the Chief, Branch of Mineral Classification, to the Manager of the appropriate Land Office (43 CFR 192.6(b)). This report (Exhibit 5 or 6) will include the completion data of the well on which the determination is based, a description of the land to be included, and the serial numbers of the Federal leases involved.

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613.3.2

- .2 Productive Limits of Oil or Gas Deposits. The Director, Geological Survey, is delegated by regulatory authority to determine the productive limits of producing oil or gas deposits as such limits were known to exist on August 8, 1946 (43 CFR 192.6; Departmental Order No. 2280, Sec. 4.613, November 29, 1946). Section 12 of the Act of August 8, 1946 (60 Stat. 950) and 43 CFR 192.82(3)(i) provide that the royalty is limited to a flat rate of $12\frac{1}{2}$ percent on all leases which were not within the productive limits of any oil or gas deposit, as such productive limits existed on August 8, 1946. The responsibility of preparing such determinations for the Director's approval is assigned to the Branch of Mineral Classification (Geological Survey Manual, Part 120.4).
- A. Procedure. Requests for such determinations may be initiated by the lessee or by the Regional Oil and Gas Supervisor. Replies to such requests will be prepared for the signature of the Director (Exhibit 7) in the Washington office of the Branch. However, the Regional or District Geologist will be requested frequently to furnish data and maps delineating productive limits of oil and gas deposits as such deposits were known to exist on August 8, 1946.
- B. Definition. It has been determined by the Department (Richfield Oil Corp., 62 I.D. 269, July 18, 1955) that the royalty limitation of $12\frac{1}{2}$ percent is not applicable to production from specified (each individual) zones underlying oil or gas deposits known to exist prior to August 8, 1946. In the above cited decision the Solicitor stated:

"The flat $12\frac{1}{2}$ percent royalty is to be extended only to such leased land as is not within the productive limits of an existing deposit, and not to such deposits as are not within the productive limits of an existing deposit. Accordingly, it seems plain that the Secretary is required to determine only whether the leased land or part of it, lies within the productive limits of a deposit in existence on August 8, 1946. This clearly conveys the idea the Secretary is only required to determine whether the land lies within the horizontal limits of any existing deposit." (Emphases added.)

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In the same decision it is also stated:

"Under item (i) of section 12 of the Act of August 8, 1946, definitions of the productive limits of oil and gas deposits found to exist on that date cannot later be changed on the basis of information developed after that date."

Accordingly, a determination of the productive limits of any oil or gas deposit relating to any field known to be productive as of August 8, 1946, will be made only for the maximum horizontal area then known regardless of how many vertical deposits. Such determinations will embrace the area of the most extensive areal or horizontal limits of any oil or gas deposit or deposits that were known to exist on August 8, 1946.

- .3 Discovery of New Oil and Gas Deposit. An oil and gas deposit discovered within the boundaries of a lease after May 27, 1941, will be entitled to a royalty limitation of $12\frac{1}{2}$ percent (Section 12, Act of August 8, 1946 (60 Stat. 650). Authority to determine whether a well has discovered a new deposit is delegated to the Director, Geological Survey (43 CFR 192.82(3)(ii) and (iii); Departmental Circular No. 2280, Sec. 4.612, November 29, 1946)). The responsibility of preparing the determination for the approval of the Director is assigned to the Branch of Mineral Classification (Geological Survey Manual, Part 120.4).
- A. Procedure. Requests for determinations as to whether a discovery was that of a new oil or gas deposit made subsequent to May 27, 1941, are initiated by the lessee. Such determinations will be prepared by the Washington office staff for approval of the Director and will be based on all available data submitted by the applicant and that contained in the Branch record data file. However, the Regional or District Geologist frequently will be called upon to furnish additional data to support the findings.

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- B. Definition. Determinations to effectuate the purpose of Section 12 of the Act of August 8, 1946, may be considered a decision as to whether a discovery of a new deposit of oil or gas has been made subsequent to May 27, 1941, and was not previously known to be productive. Any discovery made outside of the productive limits of an oil or gas deposit as such limits were known to exist on August 8, 1946, as determined under the provisions of 43 CFR 192.82(3)(i) and as discussed in the preceding section (613.3.2) of this chapter is obviously entitled to a royalty limitation of a flat rate of $12\frac{1}{2}$ percent for the production from that deposit. However, to qualify for such royalty limitation as provided under 43 CFR 192.82(3)(ii) for any production underlying a field known to be productive, a discovery of a new deposit must be made. This discovery must be on the leasehold and be made after May 27, 1941. Although this may be the first production from the leasehold, once a discovery of a new deposit has been made, the royalty limitation of $12\frac{1}{2}$ percent cannot extend to any production developed from that deposit except from the leasehold whereon the discovery of that deposit was first made.

The Solicitor in the decision of July 18, 1955 (Richfield Oil Corp., 62 I.D. 269) stated:

"That is in acting on a request under item (ii) or (iii) for a determination that the flat rate $12\frac{1}{2}$ percent royalty be granted to production from a certain deposit, the Secretary determines only whether the deposit in question is a new deposit separate and distinct from any other deposit previously discovered."

This language clearly differentiates between the determinations relating to the productive limits of any deposit as provided in 43 CFR 192.82(3)(i) and to a new deposit in accordance with 43 CFR 192.82(3)(ii) and (iii).

The considerations applying to determinations under 43 CFR 192.82(3)(ii) also apply to those under 43 CFR 192.82(3)(iii) except that the royalty limitation of $12\frac{1}{2}$ percent is extended to production from a deposit discovered after May 27, 1941, on unitized land which is allocated to a lease that has been committed to a unit or cooperative agreement or included in a duly executed and filed application for approval at the time of discovery.

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613.3.4

- .4 Cooperative or Unit Plans. Section 17 of the Mineral Leasing Act, as amended by the Act of August 21, 1935 (49 Stat. 674) authorizes lessees to unitize and collectively operate under a cooperative or unit plan (43 CFR 192.20). Regulations governing the procedures required in obtaining approval of the Director for the designation of unit areas, contraction or expansion of a unit area, cooperative or unit agreements, designation of participating areas, and termination of cooperative or unit agreements are prescribed in the Unit Plan Regulations (30 CFR, Part 226) and with more detailed instructions in the "Suggestions to Unit Proponents". The responsibility assigned to the Branch of Mineral Classification in the administration of these regulations is in passing upon the geologic justification for proposed unit or participating areas and in the determination of the depth of the test well.

A. Designation of Unit Area.

- (1) Preliminary Review. Preliminary presentations of proposed unit areas are not required but are recommended for the benefit of the proponent. In these cases the Mineral Classification Geologist will advise the proponent of the acceptability of the proposed area and the depth of the test well or suggest such modifications that might make these acceptable.
- (2) Acceptance of Application. The proponent will submit applications for the designation of unit areas to the Regional Oil and Gas Supervisor in accordance with the provisions of the Unit Plan Regulations (30 CFR 226.3). The Supervisor will prepare the designation letter for the Director's approval and if the Regional or District Geologist agrees to the proposed area and the depth of the test well, he will endorse the designation letter. If the geologist deems that certain points require explanation, he will also prepare a memorandum addressed to the Chief, Branch of Mineral Classification.

When the geologist cannot accept either the proposed area or has any question as to whether the proposed test well will provide an adequate test of the area he will not endorse the designation letter and will present his objections in a memorandum to the Chief, Branch of Mineral Classification.

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613.3.4B

In the Washington office the designation letter prepared by the Supervisor and, when such exists, the dissenting memorandum of the Regional or District Geologist will be reviewed by a staff geologist of the Branch of Mineral Classification. Endorsement of the designation letter by the staff geologist indicates concurrence. However, if the unit area proposed or depth of the test well are not acceptable, a memorandum stating the reasons for his dissension will be attached and returned to the Staff Assistant to the Chief, Conservation Division.

- B. Participating Areas. The responsibility of approving a participating area or a revision thereof by the Branch of Mineral Classification both in Washington and in the field is identical to that in the designation of a unit area described in the preceding paragraph. Section 11 of the Form of Unit Agreement (Appendix A, 30 CFR 226.12) sets forth the requirements for the establishment of participating areas and defines such areas as "all unitized land then regarded as reasonably proved to be productive of unitized substances in paying quantities."

Lands included within approved participating areas are automatically considered to be within a known geologic structure. The reverse is not true, however, as all lands within a known geologic structure are not necessarily deemed to be productive in paying quantities.

File....(State).... Oil and Gas Minutes No. ..., 1

Minutes of the Mineral Land Classification Board

Date:

Subject: Definition of the known geologic structure of thefield,
.....County,(State)

Classification Committee Present: (Include geologists and District and/or
Regional Geologist participating)

In consultation: (Include engineers of Branch of Oil and Gas Operations or
other Geological Survey personnel who may have participated)

Par. 1. Date of discovery of oil or gas well on structure.
Location of well.
Initial production of well.
Producing formation (name and geologic age).
Depths from which production is obtained.

Par. 2. Physiographic and geographic location of structure.
Brief geologic discussion of structure.
Reference to published or unpublished reports that have been
considered.
A structure map may be included as part of the minutes.

Par. 3. History of development of the field (such as number of producing
wells, dry holes, producing formations if more than one, and
date of discovery for each).

Par. 4. Based on the information, the following described lands,
embracing acres, are recommended as the known geologic
structure of the field, effective(date)....,
the date that knowledge of the productive of the field was
first established by the completion of the discovery well:

(Description of lands)

Par. 4a Alternative to Par. 4, where applicable:

- (1) Inasmuch as such determination is based in part on
development, it is recommended that the completion date
of the most recently completed well affecting this
determination be the effective date. Accordingly,
November 10, 1957, the completion date of the XYZ Oil Co.,
well 6 "Gopher", is recommended as the effective date of
this action.
- (2) The date to be considered in any action relating to the
land involved in the field is, the date on which
the boundaries of the known geologic structure were
established based on the evaluation of the available data.

1/ This number will be supplied by the Washington office, a different
series for each state.

(Continuation of discussion of preceding numbered items with file designation entered in upper right corner of each page)

Submitted and recommended by the Committee:

(Geologist) 2/ Member

(Geologist) 2/ Member

Minutes by:
(Author's name)

(District or Regional Chairman
Geologist) 2/

Reviewed by: _____ Date: _____

Approved by Mineral Land Classification Board:

(Geologist) Member

(Geologist) Member

(Branch Chief) Chairman

Date: _____

2/ Geologists participating are shown under "Classification Committee Present".

Distribution: Original for Washington office; if prepared in field, the desired number of copies will be returned; if prepared in Washington, the desired number of copies will be forwarded to the appropriate field office.

BLACK SLOUGH FIELD

T. 161-162 N., R. 92 W., 5th P.M., North Dakota

In accordance with Sec. 192.6,
43 C.F.R., I define the known
geologic structure of the

BLACK SLOUGH FIELD

as indicated hereon, effective
June 20, 1962

Arthur S. Baker

ACTING DIRECTOR
U. S. Geological Survey

August 23, 1962

T. 162 N.
T. 161 N.

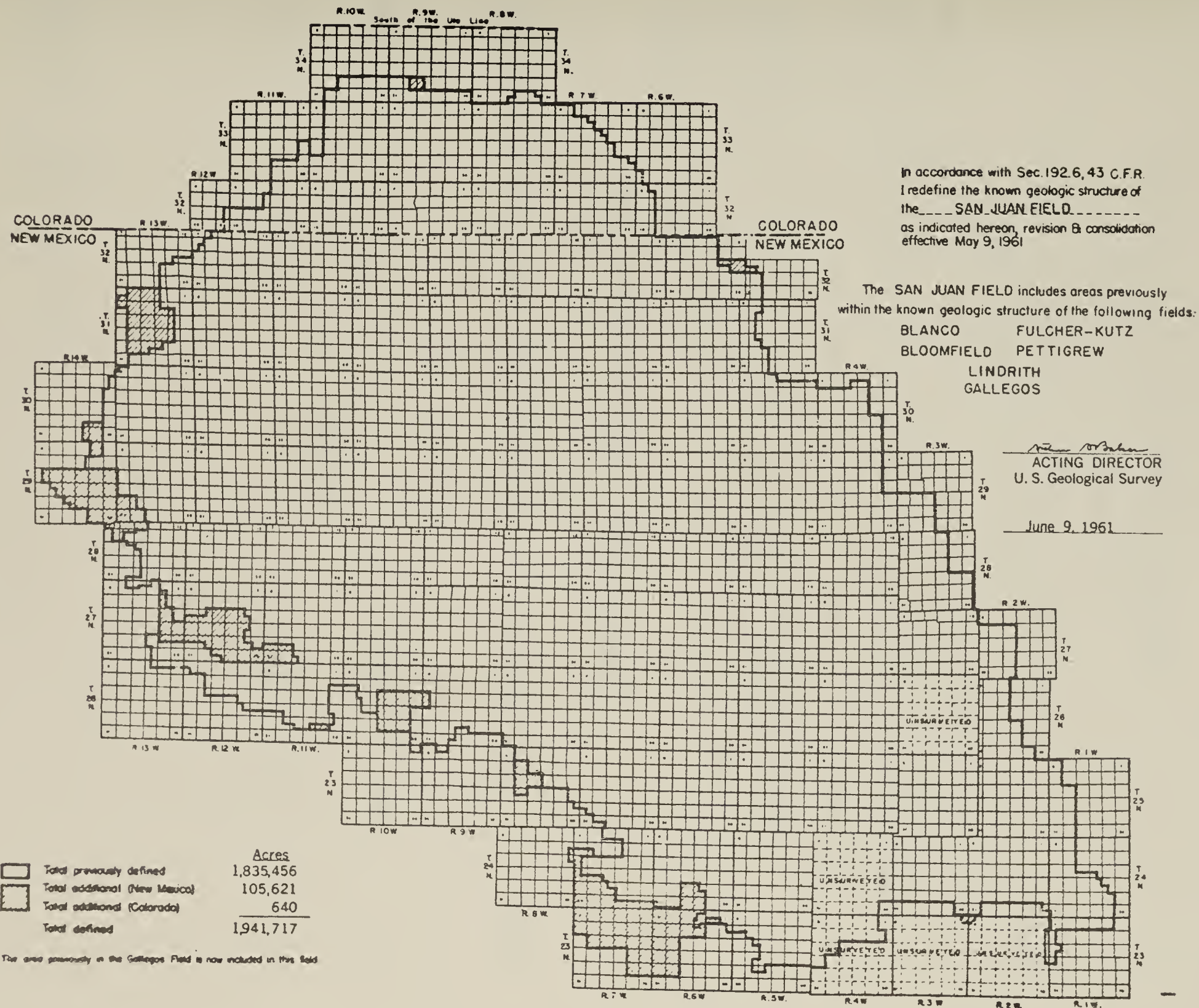
R. 92 W.

Acres

□ Total area defined

7,485

SAN JUAN FIELD—COLORADO—NEW MEXICO



UNITED STATES
DEPARTMENT OF THE INTERIOR
WASHINGTON

GEOLOGICAL SURVEY

DEFINITION OF KNOWN GEOLOGIC STRUCTURES

OF PRODUCING OIL AND GAS FIELDS

COLORADO, MISSISSIPPI, MONTANA, NEW MEXICO,

NORTH DAKOTA, UTAH, WYOMING

Former paragraph (c) of sec. 227.0, Part 227, Title 30, Chapter II
Code of Federal Regulations (1947 Supp.), codification of which has
been discontinued by a document published in Part II of the FEDERAL
REGISTER dated December 31, 1948, is hereby supplemented by the
addition of the following list of defined structures effective as
of the dates shown.

Name of Field, Effective Date, Acreage

(6) COLORADO

Elk Springs-Winter Valley (Definition and Consolidation) May 28, 1962	4,833
--	--------------------------	-------

(24) MISSISSIPPI

Bude.....	October 4, 1960 ..	513
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(26) MONTANA

Elk Basin (Revision).....	April 4, 1962	11,728
---------------------------	--------------------	--------

Director

(On copies only)
Certified to be a true copy
of the original

Certifying Officer



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

Exhibit 5
Part 613, Chapter 3.

MEMORANDUM

To: Manager, Land Office,

From: Director, Geological Survey

Subject: First Discovery(serial number)....(effective date of lease)....

Survey records disclose the completion on(date).... of the first productive well on the subject leasehold. On that date well(number), drilled by in the(location).... was completed with an initial production of(barrels of oil).... per day or (cubic feet of gas per day) from the(formation).... between the depths of and feet.

1/ This discovery is a new field the full extent and significance of which is indeterminate at this time. Effective(date of completion)...., the following described lands constitute an undefined known geologic structure (or) (an undefined addition to the known geologic structure) of the field;

(Describe lands)

Leasehold(serial number and effective date of lease).... is also affected by the above determination.2/

For the Director

Copy to: Oil and Gas Supervisor (2)
Regional Geologist
District Geologist (if in Rocky Mountain Region)
Director, BLM (Minerals Staff Officer)
Discovery file
Record Data file
Unit file (if in unit area)

1/ This paragraph may be varied to fit circumstance; for alternative see Exhibit 6.

2/ If any other Federal lease or leases are affected.



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

Exhibit 6
Part 613, Chapter 3

MEMORANDUM

To: Manager, Land Office,

From: Director, Geological Survey

Subject: First discovery on private land affecting oil and gas lease
(serial number and effective date of lease)....

Survey records disclose the completion on(date)...., of the first productive well on privately-owned land which affects the subject oil and gas lease. On that date well(number).... drilled by in the(location).... was completed with an initial production of(barrels of oil per day or cubic feet of gas per day).... from the(formation).... between the depths of and feet.

1/ This discovery is an extension of the field. Effective(date)...., the following described lands are within an undefined addition to the known geologic structure of the field.

(Describe land)

Leasehold(serial number and effective date of lease).... is also affected by the above determination.2/

For the Director

Copy to: (Same distribution as Exhibit 5)

1/ This paragraph may be varied to fit circumstance; for alternative see Exhibit 6.

2/ If any other Federal lease or leases are affected.



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

Exhibit 7
Part 613, Chapter 3

Dear Mr.:

Pursuant to your request of(date)...., for oil and gas lease(serial number)...., and in accordance with 43 CFR 192.6, a determination is hereby made that

the following described lands were not within the productive limits of any oil or gas deposit on August 8, 1946, and are entitled to a royalty limitation of $12\frac{1}{2}$ percent.

or

the following described lands were within the productive limits of the field on August 8, 1946, and are not entitled to a royalty limitation of $12\frac{1}{2}$ percent.

(A combination of the above will be used when the lands are partly within the productive limits.)

Sincerely yours,

Director

Copy to: Director's chrono
GS General
Conservation Division
Oil and Gas Supervisor (2)
Regional Geologist
Director, BLM (Minerals Staff Officer) (2)

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series

Part 613 Mineral Leasing

Chapter 1 Authority

613.1.1

- .1 Statutory. The duties of the Branch of Mineral Classification in its participation in the administration of the Mineral Leasing Act of 1920, and other related acts are governed by the provisions of the following cited acts which provide for the leasing of coal, oil and gas, sodium, phosphate, potassium, oil shale, sulfur, helium, and asphaltic materials on Federal lands.

A. Public Lands

- (1) February 25, 1920 (41 Stat. 437) - Mineral Leasing Act, as amended by the acts of:

April 17, 1926 (44 Stat. 301) - Leasing sulfur in Louisiana

February 7, 1927 (44 Stat. 1057) - Potassium leases and permits

March 4, 1931 (46 Stat. 1923) - Unit or cooperative plans

March 4, 1933 (47 Stat. 1670) - Surface interference. Reports

by the Survey on withdrawn,

classified, or reported

valuable for leasable minerals.

August 21, 1935 (49 Stat. 674) - Termination of oil and gas permits.

December 24, 1942 (56 Stat. 1080) - Royalty benefits, new discovery.

August 8, 1946 (60 Stat. 650) - Royalty benefits, productive limits, oil and gas lease options.

August 2, 1954 (68 Stat. 648) - Acreage limitations Alaska.

September 2, 1960 (74 Stat. 781) - Ten-year oil and gas leases; acreage limitations coal, oil and gas, and phosphate; oil and gas lease options; asphaltic materials.

- (2) March 3, 1925 (43 Stat. 1110) - Conservation of helium, amended by act of July 26, 1954 (68 Stat. 530) - Leasing and disposal of helium lands.

- (3) August 13, 1954 (68 Stat. 708) - Multiple Use Act.

- (4) September 13, 1960 (74 Stat. 918) - Helium Act amendments.

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series

Part 613 Mineral Leasing

Chapter 1 Authority

613.1.2

B. Acquired Lands.

- (1) August 7, 1947 (61 Stat. 913) - Mineral Leasing Act for Acquired Land.

C. Tidal and Submerged Lands.

- (1) August 7, 1953 (67 Stat. 462) - Outer Continental Shelf Act.

.2 Delegated. The Branch of Mineral Classification has been assigned certain specific responsibilities in the administration of the Mineral Leasing Act. These duties have been delegated to the Director from the Secretary of the Interior (Departmental Order 2280, November 29, 1946, and 43 CFR 192.82), the responsibility of administration of which has been assigned to the Conservation Division (Geological Survey Manual, Part 120.4). Such duties that have been assigned to the Branch of Mineral Classification and the responsibilities in performing these duties are specified in the chapters that follow Part 613 of this manual.

- A. Delegation to sign "For the Director" routine memoranda, letters, or actions of essentially stereotyped nature, primarily of inter-agency concern about the mineral character of land, has been made to the Chief, Branch of Mineral Classification, or to such Branch employees that the Branch Chief may designate for special types of routine cases (Conservation Branch (now Division) Circular 88, and supplements May 24, 1939, and November 30, 1940; memorandum Chief, Conservation Division, approved by Acting Director, dated April 13, 1961). This authority is not limited to leasable minerals.

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series

Part 613 Mineral Leasing

Chapter 2 Oil and Gas Leasing

613.2.1

.1 Noncompetitive Lease Offer. All submittals of "Offer to Lease and Lease for Oil and Gas", Form 1158, and "Offer to Lease and Lease for Oil and Gas: Acquired Land", Form 1196, filed with the Bureau of Land Management, except those for the states of Alaska, Arizona, Idaho, Nevada, Oregon, Utah (west of the Salt Lake Meridian), and Washington (BLM Manual, Chapter 2.1.29B; Survey letter to BLM August 11, 1958) are submitted, in duplicate, to the Branch of Mineral Classification, Washington office, for a report as to whether any of the lands applied for are within a "Known Geologic Structure of a Producing Oil or Gas Field" (Chapter 613.3.1, this Manual).

A. Lands Not Within a Known Geologic Structure. If none of the lands are found to be within a known geologic structure both copies of the offer to lease are stamped, as indicated below, and one copy returned to the Manager and one copy retained in the Division files (43 CFR 192.6).

Date

The Director
Bureau of Land Management

The land listed in this application is
not within the known geologic structure
of a producing oil or gas field.

(Sgd: Chief, Branch of Mineral Classification
or designated alternate)

C.A.S. For the Director,
(Processor's initials) Geological Survey

- (1) In addition to a report on the structural status of the lands involved in the offer to lease, the Branch will also advise the Bureau of Land Management as to whether or not the lands are (Exhibit 1):
- (a) Partly or wholly within a unit area (43 CFR 192.41).
 - (b) Within one mile of or within a Naval Petroleum or Helium Reserve (43 CFR 192.5).
 - (c) Within that part of the Teton National Forest, Wyoming, north of the 11th standard parallel (Secretary's Order, August 15, 1947).

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series

Part 613 Mineral Leasing

Chapter 2 Oil and Gas Leasing

613.2.1B

- 11700 24
11700 24
11700 24
- B. Lands Within a Known Geologic Structure. Lands determined to be within a known geologic structure of a producing oil or gas field, either defined or undefined, prior to the date of filing an offer to lease are subject to a competitive lease under the Mineral Leasing Act, as amended (43 CFR 192.50). The Branch of Mineral Classification, accordingly, will prepare a report for the Director to the appropriate Land Office Manager (Exhibit 2) stating whether all or a part of the lands described in the offer to lease are within a known geologic structure, either defined or undefined, and will show the date when the known facts warranted such a determination (Geological Survey Circular 419; John P. Dever, 67 I.D. 367, 1960). Area Sealed in

15502

Under such circumstances that the date of filing precedes the date of the ascertainment of the facts upon which a determination that lands are within a known geologic structure is made, the lands are subject to a noncompetitive lease.

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series

Part 613 Mineral Leasing

Chapter 2 Oil and Gas Leasing

613.2.2

- .2 Competitive Leases. Any land that is within the known geologic structure of a producing oil or gas field, either "defined" or "undefined", shall be leased to the highest responsible qualified bidder by competitive bidding (Section 17, Act of February 25, 1920, as amended; 43 CFR 192.50). Lands are offered for competitive leasing by motion of the Bureau of Land Management, by motion of the Geological Survey to the Bureau of Land Management, or by request from an individual or corporation interested in the land. The Survey's recommendation for competitive sale originates in the Oil and Gas Supervisor's office. When the lands are not known to be within a "structure defined", the Supervisor's report will be referred to the Regional or District Geologist for determination as to whether the lands are within a known geologic structure either undefined or in the process of being defined. The Supervisor's report to the Bureau of Land Management will be endorsed by the Mineral Classification geologist and routed through the Chief, Branch of Oil and Gas Operations. The report will given final review and endorsement by a Mineral Classification geologist of the Washington office staff.
- .3 Conflicts. When an offer is filed to lease noncompetitively lands which are included in an entry or claim not impressed with an oil and gas reservation, the Manager, Land Office, will request a report from the Geological Survey for a determination as to whether or not the land is valuable prospectively for oil or gas (BLM Manual, Vol. VI, Chapter 2.1.13-.20). The Branch of Mineral Classification is responsible for all such determinations (Chapter 612.2, this manual) and will submit a report of its findings to the Manager (Exhibit 3). If the lands are determined to be valuable prospectively for oil or gas, the entrymen or settler will be required to consent to a reservation of the oil or gas to the United States (43 CFR 192.71). However, should it be determined that the land is not valuable prospectively, that part of the land in the offer in conflict with the nonmineral entry will be rejected.

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GEOLOGICAL SURVEY - CONSERVATION DIVISION
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Branch Program Series

Part 613 Mineral Leasing

Chapter 2 Oil and Gas Leasing

613.2.4

- .4 Application for Extension. All applications for extension of oil and gas lease, Form 4-1238, for both public and acquired lands, filed with the Bureau of Land Management, except from those states cited in Chapter 613.2.1, this manual, are submitted to the Branch of Mineral Classification for a report as to whether any of the lands applied for are within a known geologic structure of a producing oil or gas field (43 CFR 192.120), and if so, the effective date thereof. Such requests are handled and reply made to the Bureau of Land Management in the manner prescribed in Chapter 613.2.1A, this manual.
- A. Lands Not Within a Known Geologic Structure. When none of the lands in the outstanding lease for which an application has been filed for a five-year extension are in a known geologic structure, the application form is stamped in the following manner and both copies are returned to the Manager, Land Office. An executed copy of the application is subsequently returned for the Division files.

Lands described not within
known geologic structure

(Date)

(Sgd) Chief, Branch of
Mineral Classification
or designated alternate

For the Director
C.A.S.:Geological Survey

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
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Part 613 Mineral Leasing

Chapter 2 Oil and Gas Leasing

613.2.4B

- B. Lands Within a Known Geologic Structure. When the lands involved in the outstanding lease for which an application for a five-year extension has been filed are wholly or partly within a known geologic structure, the following report is typed on both copies of the application:

Date

All of the land described in item, are within the known geologic structure of the field, defined(date)..... (or) revised (or) undefined, effective(date).....

or

Of the land described in item the (describe lands).... are within the known geologic structure of the field, defined(date).... (or) revised (or) undefined, effective(date).... The remainder of the land applied for is not within the known geologic structure of a producing oil or gas field.

(Sgd) Chief, Branch of Mineral Classification
or designated alternate
For the Director

Both copies of the application are then returned to the Manager, Land Office. An executed copy is subsequently returned for the Division files. The regulations (43 CFR 192.120) provide that the lease will be extended for a period of two years for such lands that are determined to be within a known geologic structure prior to the termination date of the primary term of the lease. However, Section 17 of the Act of February 25, 1920, as amended September 2, 1960 (74 Stat. 781), provides that all noncompetitive leases issued under the amended act shall be for a primary term of 10 years. Accordingly, five-year extensions will only apply to leases granted prior to the effective date of the Act, as amended September 2, 1960.



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

Exhibit 1
Part 613, Chapter 2

MEMORANDUM

To: Manager, Land Office,

From: Director, Geological Survey

Subject: Oil and Gas Lease Offer - (serial number)

Your request of(date).... asks for a report on the subject oil and gas lease offer under the Mineral Leasing Act, as amended, involving land described therein, situated in

(Show township and range involved)

The land described in the subject offer is not within the known geologic structure of a producing oil or gas field.1/

For the Director

1/ Additional statement or statements when appropriate:

* * * * *

Partly or wholly within a unit area.

However, the land applied for is within the unit, approved
....(date)....

or

....., of the land applied for(describe land).... is within etc.

* * * * *

Within one mile of or within a Naval Petroleum or Helium Reserve.

However, the land applied for is within one mile (or within) Naval Petroleum Reserve No.... and is not subject to oil and gas leasing unless the Director, Naval Petroleum Reserves waives such restriction.

or

....., is within one mile (or within) Helium Reserve No.... and is not subject to oil and gas leasing without approval of the Director, Bureau of Mines.

* * * * *

Within Teton National Forest north of the 11th standard parallel.

However, if the land applied for(describe land)....(or all of the land applied for) is within that part of the Teton National Forest north of the 11th standard parallel, the Secretary's order of August 15, 1947, withholds such lands from oil and gas leasing.

* * * * *



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

Exhibit 2
Part 613, Chapter 2

MEMORANDUM

To: Manager, Land Office,

From: Director, Geological Survey

Subject: Oil and Gas Lease Offer - (serial number)

Your request of(date).... asks for a report on the subject oil and gas lease offer under the Mineral Leasing Act, as amended, involving land described therein, situated in

(Show township and range involved)

All of the land described in the offer is within the known geologic structure of the field defined(date).... (or) revised (or) undefined, effective(date)....

or

Of the lands described in the offer the(describe lands)..... is within the known geologic structure of the field defined(date).... (or) revised (or) undefined, effective(date)....

The remainder of the land described in the offer is not within the known geologic structure of a producing oil or gas field. 1

For the Director

1/ Additional statement or statements when appropriate relating to unit plans, Naval Petroleum or Helium Reserves, or Teton National Forest as shown in Exhibit 1.



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

Exhibit 3
Part 613, Chapter 2

MEMORANDUM

To: Manager, Land Office,

From: Director, Geological Survey

Subject: Sec. 192.71 Report (Serial number - Oil and Gas Lease Offer)

Your request of(date).... asks for a report for a classification as required by Sec. 192.71, 43 CFR, of the lands situated in

(Give township and range involved)

and included in(type of entry).... entry(serial number of nonmineral entry or entries)....

Available evidence indicates that the land referred to is in an area which may contain accumulations of oil or gas under favorable structural and stratigraphic conditions. Accordingly, the lands are classified as being valuable prospectively for oil or gas within the intent of Sec. 192.71, 43 CFR.

or

Available evidence indicates that the land described in the oil and gas lease offer has no prospective value for oil or gas as contemplated in Sec. 192.71, 43 CFR, and, therefore, is classified as nonoil and nongas land.

For the Director

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series

Part 613 Mineral Leasing

Chapter 4 Mineral Permits and Leases

613.4.1

- .1 Public Land. All applications for permits or leases for the minerals subject to lease under the provisions of the Mineral Leasing Acts of February 25, 1920 (41 Stat. 438, as amended), and of February 27, 1927 (44 Stat. 1057, as amended), are filed with the Bureau of Land Management. These applications, other than oil and gas, are then referred to the Regional Mining Supervisors of the Geological Survey for consideration and report, recommending action thereon (BLM Manual, Vol. VI, 2.4.10A; 2.5.10; 2.6.10; 2.7.10; and 2.9.9) (Geological Survey Manual, Part 621).
- A. Permits. The granting of permits to prospect for leasable minerals in unclaimed and undeveloped areas to determine the existence or workability of such mineral deposits is authorized under the Acts of February 25, 1920 (41 Stat. 438, as amended), and February 27, 1927 (44 Stat. 1057, as amended), and the governing regulations are found in Parts 191, 193, 194, 195, 196, 197, and 198, 43 CFR. The report of the Regional Mining Supervisor recommending action will provide the Bureau of Land Management with the basis of establishing whether a prospecting permit will be granted or whether the land should be offered for competitive leasing. In the Regional Mining Supervisors' offices located in Denver, Salt Lake City, Carlsbad, Anchorage, and Washington, D. C., the Mining Supervisor will call upon the Regional or District Geologist for a report as to the significant geologic factors bearing upon a determination as to whether the lands are subject to permit or lease. The geologists' responsibility is to furnish geologic data which would establish whether prospecting is necessary to determine if the mineral deposit exists in sufficient quantity and quality to indicate commercial workability. The Regional Mining Supervisor will take these conclusions into account in drafting the report to the Bureau of Land Management and will determine whether the geologic conditions and the economic and engineering factors combined indicate that prospecting is necessary to determine workability. The Regional Geologist will endorse the reports to the Bureau of Land Management, if he agrees with its conclusions, otherwise he will submit a report to the Chief, Branch of Mineral Classification stating the reasons for his dissension. The Regional Mining Supervisor's report is submitted to the Chief, Branch of Mining Operations, and it is referred to the Branch of Mineral Classification for concurrence and endorsement.

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
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Part 613 Mineral Leasing

Chapter 4 Mineral Permits and Leases

613.4.1B

The Regional Mining Supervisor at McAlester, Oklahoma, will refer applications for mineral permits to the Regional Geologist at Tulsa, Oklahoma, and the report to the Bureau of Land Management from the Regional Mining Supervisor, Billings, Montana, will be reviewed for consideration of the geologic factors by the Regional Geologist at Great Falls, Montana. The Regional Mining Supervisor at Salt Lake City, Utah, will refer applications for mineral permits to the Regional Geologist at Los Angeles, California on lands within that geologist's region. For other areas not mentioned, the Regional Mining Supervisors will refer their requests to the regional geologists' offices concerned.

B. Leases. Aside from reporting on a permit application and recommending that the land be subject to lease for the reason that prospecting is not necessary to determine the existence of a mineral deposit, the Mineral Classification Geologist is not concerned with a lease application. However, the Regional Mining Supervisor may call upon the geologist for a report on the geologic factors that may influence the selection of logical leasing units.

.2 Acquired Land. The Act of August 7, 1947 (61 Stat. 913) authorizes the issuance of permits and leases for oil, gas, oil shale, coal, phosphate, potassium, sodium, and sulfur for land acquired by the United States subject to the same conditions as in the Act of February 25, 1920 (BLM Manual, Vol. VI, 2.4.2A). The governing regulations under the Act cited above are contained in 43 CFR 191, 193 to 200. Section 402, Reorganization Plan No. 3 of 1946 (60 Stat. 1099), authorizes the leasing of minerals other than those covered by the Act of August 7, 1947 (*supra*), and the governing regulations are contained in 43 CFR 200.31 to 200.51.

All applications, other than for oil and gas, for permits or leases authorized by the Acts cited above are filed with the Bureau of Land Management and are referred to the Regional Mining Supervisor of the Geological Survey for consideration and report recommending action thereon. Procedures for reporting and the criteria for differentiating between noncompetitive prospecting permits and competitive leases is the same as that prescribed in paragraph .1 of this chapter relating to Public Land mineral permits. (See also Geological Survey Manual, Part 621).

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GEOLOGICAL SURVEY - CONSERVATION DIVISION
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Branch Program Series

Part 613 Mineral Leasing

Chapter 4 Mineral Permits and Leases

613.4.3

.3 Designation of Leasing Areas. In certain circumstances it is an administrative expediency to delineate land areas known to contain valuable deposits of leasable minerals. When sufficient geologic data is available to determine the existence of a mineral deposit of sufficient quality and quantity to be deemed workable, the area may be delineated and determined to be subject to lease under the provisions of the Mineral Leasing Act of 1920 (41 Stat. 437), and pursuant to authority contained in the Act of March 3, 1879 (43 U.S.C. 31), as supplemented by Reorganization Plan No. 3 of 1950 (5 U.S.C. 481, note), and Secretary's Order No. 2563 (15 F.R. 3193). Such actions serve two administrative purposes: (1) Permit applications will be automatically rejected for any of the lands within the designated area; and (2) the requirement of reserving the rights of the leasable mineral so designated to the United States becomes self evident.

A. Definition. Administratively, the "leasing area" is that area defined by the Director, Geological Survey, in accordance with the provisions of the authority cited above.

Technically, it is that area in which there is direct evidence that the mineral deposit is known or believed to exist in sufficient quantity and of such quality to establish that the deposit is commercially workable and that prospecting is not required to determine these factors.

B. Procedure. Geologists of the Branch of Mineral Classification will assemble all pertinent geologic data and prepare contour and isopach maps and cross sections to determine the extent and thickness of the mineral deposits under review and will collect and analyze mineral samples to determine whether the deposit is of minimum workable quality. Minimum standards that will be applied as to thickness, and which establish the quantity and quality will be those appearing in the approved Standards (Chapter 4.1, Part 611, this Manual).

When the geologic data have been assembled and the quantity and quality established, factors must be considered to determine workability which will then become the deciding factor in the question of competitive leasing versus noncompetitive prospecting permits. The factors that will determine workability are of an economic and engineering nature. This phase of the determination, therefore, is properly assigned to the Branch of Mining Operations. The final product is one of collaboration between the Mineral Classification Geologist and a Professional Engineer of the Branch of Mining Operations.

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series

Part 613 Mineral Leasing

Chapter 4 Mineral Permits and Leases

613.4.3B(1)

- (1) Minutes. The factors considered in arriving at a determination of a leasing area shall be recorded as formal minutes prepared in the form prescribed in Exhibit 1. These minutes shall include a complete land description of the area to be included, bear the signature of the geologists and mining engineers involved in the considerations, and then be submitted to the respective Branch Chiefs for acceptance.
- (2) Leasing-Area Plats. After the proposed leasing area has been accepted by the respective Branch Chiefs, a plat will be prepared and submitted to the Director for approval. After approval the plats will be reproduced for distribution and unless impracticable shall be 8" x 10 $\frac{1}{2}$ " in size in the form shown in Exhibit 2.
- (3) Distribution of Plats. The leasing-area plats will be distributed to the Manager of the appropriate Land Office and to the following offices in accordance with current instructions regarding distribution:

Manager, Land Office for State involved.
Regional Mining Supervisor for States within region.
Regional Geologist for States within region.
District Geologist.
Director, BLM (Minerals Staff Officer).

- .4 Designation of Areas Valuable Prospectively. The determination of areas valuable prospectively for leasable minerals is made where geologic data suggest that the mineral may be present meeting classification standards. Positive information on the quality, thickness, and depth of occurrence is lacking principally because of the absence of adequate mapping and developments. To preserve the Government mineral estate and prevent loss of title through nonmineral entries this type of classification is made.

- A. Definition. "A valuable prospectively area" is that area defined by the Director, Geological Survey, pursuant to authority contained in the Act of March 3, 1879 (43 U.S.C. 31), as supplemented by Reorganization Plan No. 3 of 1950 (5 U.S.C. 481, note), and Secretary's Order No. 2563 (15 F.R. 3193).

This determination is applied to either withdrawn areas or areas not withdrawn but containing Federal lands.

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series

Part 613 Mineral Leasing

Chapter 4 Mineral Permits and Leases

613.4.1B

B. State base maps showing areas of lands valuable prospectively for leasable minerals will be maintained.

C. Procedure. Geologists of the Branch of Mineral Classification will assemble all pertinent geologic data to determine the extent of the mineral deposit under consideration. From available maps, cross sections, and other information they will prepare minutes justifying the area or areas so designated.

(1) Minutes. The geologic factors considered in determining the prospective area shall be recorded as formal minutes prepared in the form prescribed in Exhibit 1. These minutes shall include a complete land description of the area to be included, bear the signatures of the geologists involved, and then be submitted to the Chief of the Branch for review and approval.

(2) Prospective Area Maps and Plats. After the proposed valuable prospectively area or areas have been accepted by the Branch Chief, a plat or map will be prepared and submitted to the Director for approval. After approval the map or plats will be reproduced for distribution. Unless infeasible, the plats shall be 8" x 10 $\frac{1}{2}$ " in size in the form shown in Exhibit 2.

(3) Distribution of Maps and Plats. The prospective area maps or plats will be distributed only to the offices of the Division concerned.

File:(State)....(mineral) Land Leasing Minutes No. ...1/

Minutes of the Mineral Land Classification Board

Date:

Subject:(name).... Leasing Area

Classification Committee Present: (Name geologist(s) and mining engineer(s)
preparing and reviewing data.)

In consultation: (Include geologist(s) and/or mining engineer(s) participating.)

(Outline)

1. Introduction.
2. Legal Considerations.
3. History of ...mineral... Exploration, Discovery and Development.
4. General Factors.
 - A. Location.
 - B. Physiography.
5. Stratigraphy.
6. Structure.
7. Description of Mineral Deposit.
8. Classification Standards.
9. Basis for Classification.
 - A. Geologic.
 - B. Economic.
10. Description of Land in Leasing Area.
11. References.

Submitted and recommended by the Committee:

(Geologist)2/ Member

(Mining Engineer)2/ Member

Minutes by: _____
(Author's name) or (Regional Geologist) Chairman
(Regional Mining Supervisor)2/

Reviewed by: _____ Date: _____
Branch of Mineral Classification

_____ Date: _____
Branch of Mining Operations

....(State)....(mineral) Land Leasing Minutes No. ..

(Last page should have some text in addition to signatures)

Approved by Mineral Land Classification Board:

(Geologist) Member

(Geologist) Member

(Branch Chief, Mining) Member

(Branch Chief) Chairman

Date: _____

1/ This number will be supplied by the Washington office in a numerical series separate from the classification minutes series.

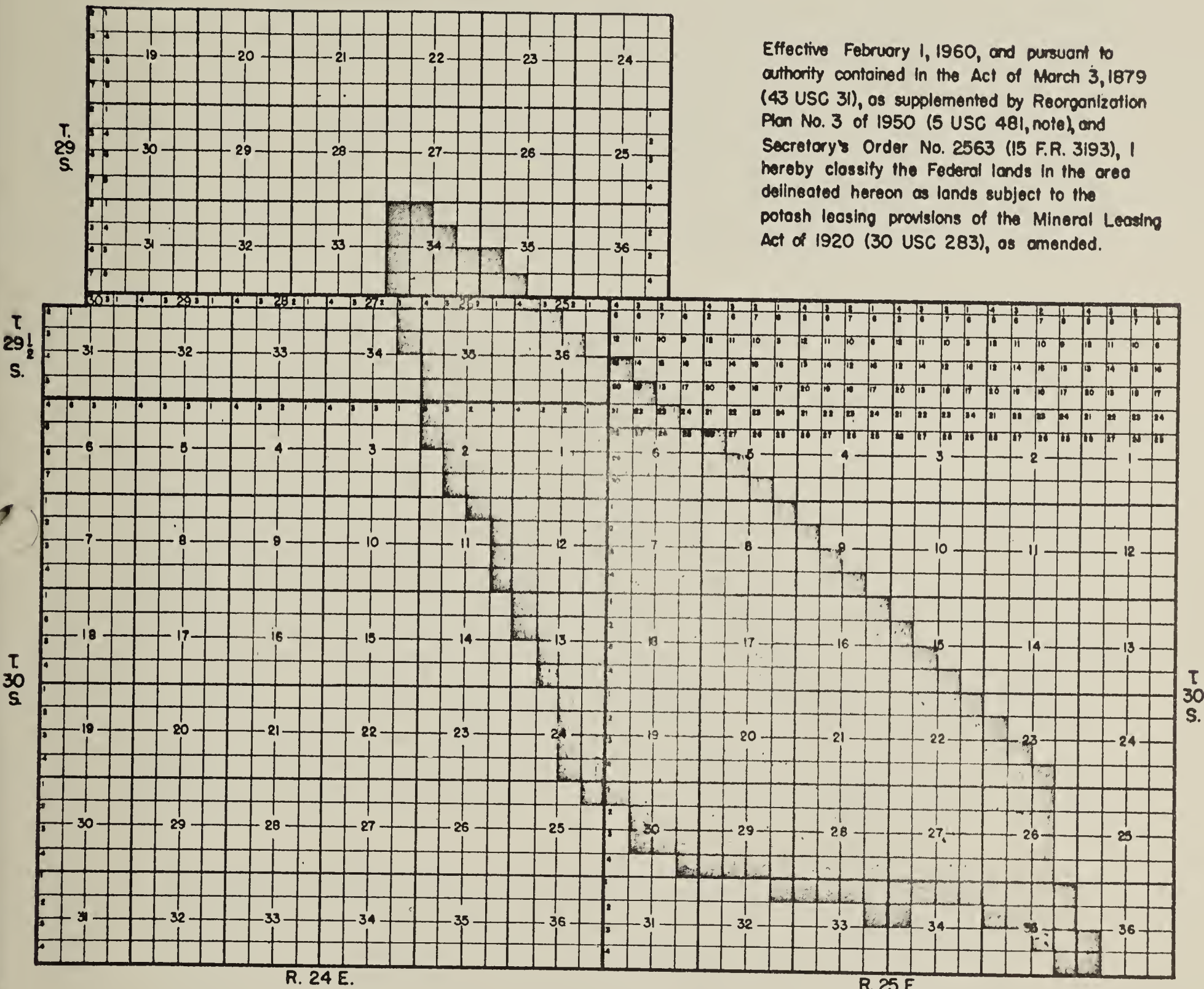
2/ Geologists and Mining Engineers as shown under Classification Committee Present.

Distribution: Original for Washington office; if prepared in field the desired number of copies will be returned; if prepared in Washington the desired number of copies will be forwarded to the appropriate office.

LISBON VALLEY POTASH AREA

Ts. 29-29½ S., R. 24 E., T. 30 S., Rs. 24-25 E., S.L.M., Utah

Effective February 1, 1960, and pursuant to authority contained in the Act of March 3, 1879 (43 USC 31), as supplemented by Reorganization Plan No. 3 of 1950 (5 USC 481, note), and Secretary's Order No. 2563 (15 F.R. 3193), I hereby classify the Federal lands in the area delineated hereon as lands subject to the potash leasing provisions of the Mineral Leasing Act of 1920 (30 USC 283), as amended.



Total area subject to lease

16,178 acres

[Signature]

ACTING DIRECTOR
U. S. Geological Survey

May 18, 1960

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Chapter 1 Conservation Division

618.1.2

- .2 Mining Operations. The Mineral Classification geologist's relationship with the Regional Mining Supervisor is identical to that described above relating to oil and gas operations. Requests for geologic assistance or opinions will initiate from the Regional Mining Supervisor or the District Engineer and will usually be in the field of processing permit and lease applications, designating leasing areas, and aid in the supervision of mining operations. Such requests will be analyzed by the geologists receiving it and they will be guided by the procedures outlined in the introductory paragraph of this chapter. The recommendation for granting a permit or a lease is the decision of the mining engineers.
- .3 Waterpower Classification. Aside from the cooperatively prepared reports on dam and reservoir sites described in Part 611.2.2, this Manual, the Branch of Mineral Classification will also perform such geologic services on problems of classification relating to waterpower and water storage resources of the public domain as may be requested by the Chief, Branch of Waterpower Classification.

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Chapter 2 Department of the Interior

618.2

The Branch of Mineral Classification is frequently called upon by other Department of the Interior Bureaus to provide reports on the mineral character of lands being considered for disposal, exchange, or in some instances acquisition. The function of the Branch is not to appraise, but it cooperates by furnishing information as to whether lands may be valuable prospectively for minerals. The reports are in the nature of informal general classifications and not in any instance specific evaluations or analyses of the market for mineral interest.

In most cases the report is made on the basis of the available geologic information on the area. Where such general information is not available in the Washington office, the appropriate field office may be requested to provide the required information from readily available sources. Field examinations in such cases will not be made unless specifically requested. There are instances when the requesting bureau asks for a report which involves a substantial area and indicates a need for more specific information as to the potential mineral value than can be furnished from available information and field examinations are necessary. In such cases the requesting bureau is advised of the situation with an estimate of the cost of the field examination. If the requesting bureau is able to supply the necessary funds, an interbureau agreement is entered into and the project then proceeds with the work assigned to the appropriate regional office. Upon the completion of the work, a report is prepared and submitted with a complete accounting of all expenditures. The requesting bureau will then make the necessary transfer of funds in accordance with the agreement. Dollar valuation of properties are occasionally made by the Branch of Mining Operations and the Branch of Oil and Gas Operations. The Branch of Mineral Classification does not make dollar appraisals.

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Chapter 2 Department of the Interior

618.2.1

- .1 Bureau of Land Management. The delegated responsibilities of the Geological Survey and the assignment of those functions to the Branch of Mineral Classification in various areas of public land administration, relating to mineral land and waterpower classification, mineral leasing, land disposal under the public land laws, and with related acts in which the Survey participates cooperatively with the Bureau of Land Management are fully covered in Parts 611, 612, and 613 of this Manual. However, the Bureau of Land Management on occasion requires special geologic reports on large areas of land calling for field investigations. At times these investigations are performed by the Mineral Classification geologist with the cost borne by the Bureau of Land Management.

When requests for such investigations are received from the Bureau of Land Management, an estimate of the costs are submitted to them. Upon approval to proceed with the investigations, the project is assigned to the appropriate Regional Geologist. The geologist assigned as chief of party will conduct the required investigations and prepare a report as set forth in the authorizing request. The final report and a complete account of all expenditures including salaries will be submitted to the Branch Chief, through the Regional Geologist, for transmission to the Bureau of Land Management.

- .2 Bureau of Indian Affairs. A series of legislative actions dating from 1908 has authorized the Secretary of the Interior to lease tribal and allotted Indian lands for the purpose of mining, including oil and gas. Under agreements with the Bureau of Indian Affairs, the Branch of Oil and Gas Operations and the Branch of Mining Operations supervise operations on Indian lands under lease, with the exception of the Osage Nation, Oklahoma. The Branch of Mineral Classification participates in this activity only if asked to assist by the Oil and Gas or Mining Branches.

The Branch of Mineral Classification is frequently called upon by the Bureau of Indian Affairs to furnish reports as to the prospective mineral value of both tribal and allotted lands. These requests are generally related to the sale by the Indian land owners of individually-owned land. Where the Geological Survey reports the land to be valuable prospectively for minerals, the Indians are urged to reserve all or part of the mineral rights. In all instances the Branch of Mineral Classification reports whether the Indian lands are or are not valuable prospectively for minerals, metalliferous or nonmetalliferous, including oil or gas. In no event is a dollar value placed on the lands. When appraisals requiring monetary values are requested, they are referred to engineers of either the Branch of Oil and Gas Operations or the Branch of Mining Operations.

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618.2.3

- .3 National Park Service. This bureau submits through the Bureau of Land Management requests for reports on the prospective mineral value relating to the sale, grant, or lease of public lands for recreational purposes; and on the exchange of public lands to eliminate private holdings from National Parks and National Monuments. These exchanges are made on the basis of equivalent values.
- .4 Bureau of Reclamation. This bureau occasionally requests a report as to mineral value of lands proposed for public sale within reclamation withdrawals. The requests usually ask what mineral reservation, if any, should be made to the United States and if there is any objection to the proposed sale.
- .5 Fish and Wildlife Service. The Bureau of Sport Fisheries and Wildlife of the Fish and Wildlife Service requests reports as to the mineral value of lands involved in State exchanges, as by law such lands are required to be nonmineral in character. Reports are often requested on the prospective value for leasable minerals in game reserves and refuges or in proposed reserves in connection with leasing activities.

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Chapter 3 Interagency

618.3

The Branch of Mineral Classification is also frequently called upon to provide Federal agencies outside of the Department of the Interior with assistance in matters pertaining to the mineral values of land under their jurisdiction. Such requests for assistance are handled identically with those described in the introductory paragraph of the preceding Chapter 2 of this Manual (Part 618.2). These requests may involve outright disposal or alienation of the mineral rights, the terms of issuance of mineral permits or leases, exchanges of lands, or may be needed in connection with lawsuits or other conflicts of interest. Frequently, the requests include a desire for determinations as to the water resource value as well as the prospective mineral value. In such instances the reports are handled cooperatively with the Branch of Waterpower Classification.

- .1 Federal Power Commission. This agency requests reports and recommendations on applications for preliminary permits and licenses for proposed waterpower developments from all Federal and State agencies. These requests come from the Project Review Coordinator, Office of the Assistant Secretary, Water and Power Development through the Staff Engineer of the Director's office of the Geological Survey. The Staff Engineer circulates the request to the other Divisions of the Survey for comment and recommendations. In the Conservation Division the request is handled by the Branch of Waterpower Classification which refers it to the Branch of Mineral Classification for a report on the mineral value of the lands involved. The Division reports are submitted to the Staff Engineer where the final Survey report is prepared and forwarded to the Project Review Coordinator. In addition to the Geological Survey, the applications are also referred to the Bureau of Mines, Fish and Wildlife Service, National Park Service, and Bureau of Reclamation. The Project Review Coordinator prepares the reply to the Federal Power Commission based on the reports and recommendations received from the bureaus within the Department.

The responsibility of the Branch of Mineral Classification is to assess the extent to which mineral resources will be affected by the proposed projects, and whenever appropriate, to suggest such further investigations as may be deemed necessary to provide a more satisfactory appraisal.

- .2 Department of Defense. Special geologic reports are occasionally prepared for the Departments of the Army, Navy, or Air Force, at their request. These evaluations are usually of the prospective mineral value or for the purpose of ascertaining whether drainage of oil or gas is taking place within specified stations or bases. Also on occasion, the Director, Naval Petroleum Reserves requests special reports relating to problems involving geologic investigations relating to oil and gas operations within or adjoining the Naval Petroleum Reserves.

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618.3.3

- .3 Department of Health, Education, and Welfare. This agency requests reports as to the "known presence of minerals of a commercial nature" on Federal lands which have been declared surplus and are to be transferred to some local government jurisdiction, such as for schools or hospitals. Replies are made on much the same basis and reasoning as for "co-ops". In the event nonleasable minerals are involved field investigations may be deemed necessary.
- .4 Department of Agriculture. Reorganization Plan No. 3 of July 16, 1946 (60 Stat. 1097), transferred functions relating to the leasing of certain mineral lands from the Secretary of Agriculture to the Secretary of the Interior, and the Acquired Land Act of August 7, 1947 (61 Stat. 913), provided that leasing of the same minerals designated in the mineral leasing laws relating to public lands would be governed by the provision of those laws. Accordingly, the "leasable minerals" on acquired lands are governed by the provisions of the mineral leasing laws, whereas the other minerals (the "locatable minerals" under the mining laws) are governed by the provisions of Reorganization Plan No. 3 of July 16, 1946. The Branch of Mineral Classification participates in the administration of the leases and operations thereunder to the same extent as for public lands as described in Part 613 of this Manual.

Reorganization Plan No. 3 of June 11, 1960 (74 Stat. 205), transfers from the Secretary of the Interior to the Secretary of Agriculture certain functions relating to exchanges of for national forest lands or timber. Section 2 of this Act provides that in no case shall exchange of land provide for the patenting of lands without a reservation of minerals unless the Secretary of Interior (1) has advised that the land is nonmineral in character, or (2) has approved of the valuation and disposition of the minerals in the lands to be patented. In order to provide procedures for the fulfillment of the requirements of this Act, the Forest Service of the Department of Agriculture, the Bureau of Land Management, and the Conservation Division of the Geological Survey mutually established preliminary instructions dated November 14, 1960, to handle all such exchange cases. In accordance with these instructions, the Branch of Mineral Classification will follow the following procedures:

- A. A request, in duplicate, will be made by the Regional Forester for a mineral determination of the offered and selected lands to the Conservation Division, Washington, D. C. A copy is sent to the appropriate Regional Geologist.
- B. The appropriate Regional Geologist will forward the copy of the request to the Washington office within one week of receipt with any new or helpful information on the lands.

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618.3.4(c)

- C. Within two weeks to one month the Branch of Mineral Classification will submit a report to the Regional Forester with a copy furnished to the Forest Service Washington office.
- D. If the lands are determined to be valuable or valuable prospectively for leasable minerals, or if other minerals may be present, the exchange may be negotiated on the basis of:
 - (1) Reserving the selected land minerals in the United States, or
 - (2) Conveying minerals on the basis of value to be established by an appraisal.
- E. If the Forest Service decides the selected land minerals are not to be reserved to the United States:
 - (1) The Forest Service examiners will make an appraisal of the mineral value and a copy of the appraisal will be sent to the Bureau of Land Management and the Geological Survey.

(Reference: Forest Service memorandum, File No. 5430, November 14, 1960; BMC memorandum, November 30, 1960, and supplement of March 17, 1961.)

- .5 Department of Justice. Requests received from the Department of Justice primarily stem from law suits in which the United States is involved. They are usually concerned with prospective mineral values or with questions of fact as of a certain date and for specific tracts of land. In general, it is not the policy of the Geological Survey to tie up its personnel in actual court appearances and only rarely is permission granted by the Director for this purpose. The usual procedure is to supply written reports or affidavits, depending on the situation.
- .6 General Services Administration. Requests from this agency are for mineral reports on scattered tracts of Federal land under its jurisdiction for which disposal is contemplated. Replies are similar to those prepared for the Department of Health, Education, and Welfare, and may involve the same land reported on to the other agency.

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- .7 Alien Property Custodian (Department of Justice). This agency requests reports on the mineral values of lands under its jurisdiction which are being proposed for disposal, including the mineral rights. Replies to these requests are usually prepared cooperatively with the Branch of Oil and Gas Operations or the Branch of Mining Operations. It is one or the other of these branches that will make the dollar-value appraisal of the land. The Branch of Mineral Classification will report only as to whether or not the land is valuable prospectively for its mineral content or will provide the necessary geologic report to assist the other branches in preparing the mineral evaluation of the property. Aside from reports which are based on information readily available in the Division files, the Custodian of Alien Property has entered into an agreement to repay the Geological Survey for costs of conducting the necessary investigations and preparation of reports. The Mineral Classification geologists assigned to any such investigation shall submit a record of all time and expenditures involved.
- .8 Other Agencies. The Branch of Mineral Classification is occasionally called upon to make reports on the mineral values of lands administered by other agencies of the Federal Government or furnish geologic consultative service that may be requested. The Post Office Department has on occasion requested advice and reports as to the veracity of representations relating to geology and mineral potentials in stock sales promotions in which the mails were used which may involve fraud. Representatives of the Securities and Exchange Commission on occasion have also requested opinions as to the reliability of the geologic representations in connection with applications for a license to issue stock.

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Part 619 Records and Reports

Chapter 1 Records

619.1.1

- .1 Record File. The Washington office of the Branch of Mineral Classification maintains record files of all classification actions, withdrawals, and restorations, and of pertinent geologic data and records of mineral occurrence that are essential in making the determinations for which the Branch is responsible in mineral land classification and mineral leasing administration.
- A. Record Data. These files contain all the geologic, mineral occurrence, and classification data prepared by or accumulated by the Branch. They consist of the "Record Data File" which contains material filed by township and range and the "General Report File" containing classification and known geologic structure minutes and area reports involving more than a single township. Unpublished reports prepared by Branch geologists and by other units of the Geological Survey which have not been placed in open file and data acquired confidentially from private sources are marked accordingly and are for Government use only and are not available for public inspection.
- B. Classification Plats. The original plats are maintained in the Washington office. These plats (Exhibits 6 and 7, Part 611.5 this Manual) show graphically the land areas withdrawn, classified, and/or restored for each township on 8" x 10 $\frac{1}{2}$ " sheets at a scale of one inch to the mile. The geologist preparing each classification action is responsible for preparation and revision of the official plats involved. Copies of the plats are distributed in the manner described in Part 611.5.3E of this Manual.
- C. Mineral Record Cards. These cards (Exhibit 1), 4" x 6" in size, contain for each mineral occurrence a concise record of the data consulted in the preparation of the mineral occurrence maps (Part 619.1.2B(4), this Manual). The cards are prepared by or under the direction of the geologist assigned to the compilation of the map and are prepared in duplicate, one for the Washington office file and one for the Regional office.

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Part 619 Records and Reports

Chapter 1 Records

619.1.2

.2 Maps. The Washington office maintains a series of control maps used in daily classifications and determinations of mineral values and for determinations in connection with oil and gas lease applications.

A. Oil and Gas.

- (1) Known-Geologic-Structure Maps. State maps showing all known geologic structures both defined and undefined are maintained on a current basis for use in making structure reports on oil and gas lease applications. From all available sources, including reports from the Branch of Oil and Gas Operations district engineers, Mineral Classification geologists, oil scouting services, and periodicals, new oil or gas wells which are located outside of defined or undefined known geologic structures, are posted daily on these maps as received.
- (2) Development Maps. Large scale development maps of fields in the public land states where oil and gas operations on Federal lands are most active are prepared by the Branch of Oil and Gas Operations. These maps in the most active areas are maintained on a current basis from the sources described in the above paragraph.
- (3) Unit Maps. State maps showing all approved unit areas are maintained and used in the determinations required in reporting on oil and gas lease applications.

B. Land Disposal.

- (1) Classification Maps. State maps for each of the leasable minerals showing areas in withdrawals, lands classified as mineral or nonmineral, and lands restored without classification are maintained on a current basis.

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Chapter 1 Records

619.1.2B(2)

- (2) Determination Maps and Plats. State maps indicating the townships checked for occurrences of minerals are maintained in the aid of making mineral determinations on land disposal cases. When a township is checked and a determination of the existence or nonexistence of locatable minerals is made, the date of the determination is stamped within the township which is also outlined in color (orange) and if no mineral is known to exist the entire township is colored (green). Where a township is worked, a 1" = 1 mile plat is made and the word "plat" is stamped in the township on the State map. The symbol "X" indicates a classification card is on file.

The detail plats (Exhibit 2) are 8" x 10 $\frac{1}{2}$ " on a scale of one inch to a mile and show with as much accuracy as is possible the location of the mineral occurrences with appropriate notes. The date the plat is made, the date of subsequent determinations where mineralization is involved, and a list of pertinent reference material used in making the determination are all recorded on the plat. Nonmineral land is colored (green). These plats are replacing an earlier and smaller scale plat.

- (3) Maps Showing Minerals Valuable Prospectively. State maps showing the areas known to be mineral or believed to be valuable prospectively for leasable minerals are generally prepared in the Regional offices where more readily available information is at hand. These maps are under constant revision as new information is appraised indicating whether or not lands in the Public-Land States are valuable prospectively for any of the leasable minerals.
- (4) Mineral Occurrence Maps. State maps showing the occurrences of the locatable minerals are prepared in the Regional offices. Such mineral occurrences are indicated by standard symbols plotted on the map by section. All available sources of information are used in the compilation of these maps and a resume of the pertinent information and bibliography of source material is recorded on the Mineral Record Cards (Part 619.1.1C).

ORE MINERAL		MINERAL RECORD CARD		STATE	
COUNTY				SECTION	TOWNSHIP
MINING DISTRICT		LOCATION IN SECTION OR WITH REFERENCE TO LANDMARK			
NAME OF MINE OR PROSPECT					
GEOLOGY					
STATUS <input type="checkbox"/> PRODUCTION <input type="checkbox"/> NO PRODUCTION		REMARKS			
REFERENCES					

DATE OF CARD

U.S. DEPT. OF INTERIOR
GEOLOGICAL SURVEY
FORM 9-1232 (REV. AUG. 1960)

OTHER INFORMATION

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Part 619 Records and Reports

Chapter 2 Reports

619.2.1

.1 Monthly Reports. A Division monthly report for the Director on the regular program of the Branch is required and is compiled in the Washington office. The consolidated Division report must be completed and submitted not later than the ninth of the next succeeding month.

A. Regional Office. Reports from the regional offices serve as a basis for reporting to the Director on the progress made on maps and reports being prepared by the field geologists for publication or for information on a particular area. It is, therefore, important that the reported percentages of completion be accurate and that the percentages reflect the changes for each month. Information concerning the progress made on each project or assignment is required with the project information entered on Form 9-041a (Exhibit 1) (Memo., Chief, BMC., April 9, 1962).

The monthly report from the Regional office will be prepared in sufficient time to reach Washington not later than the seventh of the month and the Regional Geologist will make the necessary arrangements for the District Geologists to submit material concerning the respective districts in ample time to meet the deadline. No rigid format has been established except on projects. These reports, however, should be an account of work performed by Branch personnel and not by industry or others. Although all activities of the Regional offices are reported upon, brevity is an essential key note and repetition of information previously reported by memoranda except in summary form is to be avoided. The report will contain sections on administration, personnel, and general information which will include:

(1) Administration.

- (a) Completed assignments.
- (b) New activities.
- (c) Uncompleted work.
- (d) Show total number of each of the following actions participated in or prepared by mineral classification geologists:
 - (i) Proposed unit designations (including expansions or contractions).
 - (ii) Proposed participating areas (initial and revisions).
 - (iii) Reports on first production from leases.
 - (iiii) Discovery letters processed.
- (e) Forest Service Exchange reports - show number processed.
- (f) Known Geologic Structure determinations and revisions - list by name and state each structure definition recommended during the month.

Note: Project information need be shown on Form 9-041a only.

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Part 619 Records and Reports

Chapter 2 Reports

619.2.1A(2)

(2) Personnel. Include personnel items of significance such as new appointments, transfers, resignations, etc. Personal items of general interest will be included and will be brief. Report on leave of staff members only if it involves a week or more.

(3) General Information.

(a) Oil and Gas and Mineral Development. Report on geologic significance of new discoveries and not on engineering data which is available from other sources.

(b) Visitors. Show total number of visitors to each office; comment only on those of particular interest to the Division.

(c) Miscellaneous. Include items of general interest relating to administrative functions of region, meetings and field trips of geologic societies participated in by staff members, and notes on interesting geologic explorations in region.

(4) Management Improvement. Comment on any measures affecting activities within region.

(5) Cooperative Work. Comment on any cooperative work with other branches of the Division, other divisions of the Survey, other Federal bureaus and agencies, state or local government agencies, including information as to requests received, response or reaction thereto, and commitments that may have been made.

B. Washington Office. The Washington office of the Branch contributes to the Division monthly report to the Director on branch activities. This report consists mainly of statistical data on administrative and land disposal actions on Federal lands holdings showing the number of cases handled for the following listed items:

- (1) Mineral and water resource reports (co-ops).
- (2) Oil and gas structure determinations.
- (3) Mineral leases and permits.
- (4) Oil and gas discoveries reported.
- (5) Reports to agencies other than Bureau of Land Management.
- (6) Reports to industry or individuals.
- (7) Total (of above) administrative needs served.
- (8) Average per working day.

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Part 619 Records and Reports

Chapter 2 Reports

619.2.2

The Washington office report also includes brief comments on significant personnel items, notes on completed projects and assignments, and other items of general interest. The Washington office report may also include a summary of field work accomplished and items of significance in performing the functions of the Branch.

For the Division report the Branch also prepares Form 9-314, Producing Oil and Gas Structures (Exhibit 2), and Form 9-521, Summary of Outstanding Mineral Withdrawals and Classifications (Exhibit 3), both statistical reports.

- .2 Annual Reports. The Branch of Mineral Classification prepares a brief summary report of activities in draft form for inclusion with the Division's contribution to the Fiscal Annual Report of the Secretary, Part II. This is a report of activities which is basically a summation of the number of actions completed during the fiscal year as reported in the monthly reports and a concise summary of areas of public land that were classified, and upon which geologic mapping for classification purposes in the aid of mineral leasing and for waterpower resources have been completed. The Branch draft contribution is compiled in the Washington office usually in June prior to the close of the fiscal year. The Regional Geologists will receive special requests with appropriate instructions for the submittal of a summary of activities and accomplishments.
- .3 Technical Reports. Geologic reports of various types are an important product resulting from field investigations required in performing the administrative functions of the Branch. Investigations for the needs of mineral land classification, dam and reservoir sites, and in the administration of mineral leasing result in the preparation of reports and/or maps. The completed product may fall into any one of three categories; namely (1) administrative use, (2) open-file release, or (3) publication (Survey or outside).
 - A. Policy. Survey policy requires that results of investigations must be made available to the public simultaneously with release to special parties. To conform to this policy the following rules must be observed:

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Chapter 2 Reports

619.2.3B

(1) Results of examinations not intended for open file or for publication are to be furnished only to the requesting Branch and the Washington office.

(2) Each such report shall be marked "For U. S. Government Use Only", and is not available for public distribution or inspection.

B. Administrative Use. Reports or maps on various types of investigations by the field geologists frequently result from requests from the Branch Chief or from the Supervisors of the leasing branches for spot examinations required in administrative actions relating to classifications affecting land disposal cases or mineral leasing problems. Such requests are for administrative needs and seldom are intended for publication.

C. Open-File Release. When a report or map is not to be published immediately but it is considered that the information is of limited or local interest, it may be made available to the public by placing the report or map on open-file release.

(1) The Regional Geologist will submit a request to the Branch Chief for open-file release including a statement giving the distribution of the press notice desired which will determine whether or not it shall be a Departmental release or simply a Geological Survey release. Exhibits 4 and 5 are typical examples of the types of press notices.

The author will prepare, in draft form, a press notice, in triplicate, to accompany the request using as a guide Exhibit 4 or 5, whichever is appropriate. Two copies of the map and/or report approved by the Regional Geologist and cleared by the Geologic Names Committee, Denver, Colorado, will accompany the request.

(2) Upon approval of the request by the Branch Chief, the report and maps will be submitted to the Division Chief and the Director for approval.

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Chapter 2 Reports

619.2.3C

- (3) Following approval, a draft of the press release will be prepared in the Branch with a request for duplication and distribution. If wide distribution is deemed desirable, a Departmental release is requested, otherwise the Geological Survey type of release is used. Copies of the press release draft and the requests are submitted through the Division Administrative office for action.

D C. Reports for Publication. Reports and maps proposed for publication in all media are approved by the Regional Geologist, reviewed and approved by the Branch Chief for approval. These maps and reports must be prepared in strict adherence to Geological Survey standards and techniques (BMC Handbook, Chapter III, IV; USGS "Preparation of Illustrations", and USGS "Suggestions to Authors") for the type of publication applicable.

- (1) Publication by Geological Survey. Publication by the Geological Survey of reports and maps prepared by the geologists of the Branch of Mineral Classification is basically governed by the agreement of June 11, 1957 (Exhibit 6), between the Conservation and Geologic Divisions. Field men will be expected to conform rigidly to the procedures established therein.
 - (a) Procedures for editing and processing are detailed in a memorandum from Chief, Branch of Mineral Classification, dated April 8, 1961 (Exhibit 7), and supplemented by a memorandum from Branch Geologic Map Editor, dated November 17, 1961 (Exhibit 8)
 - (b) Any map or report presented is to be sent to the Branch Publications Unit in Denver first. After the Branch Editor's approval, the material will be transmitted to the Washington office for Branch, Division, and Director's approval.

Department of the Interior
GEOLOGICAL SURVEY - CONSERVATION DIVISION
BRANCH OF MINERAL CLASSIFICATION MANUAL

Branch Program Series

Part 619 Records and Reports

Chapter 2 Reports

619.2.3C

- (2) Outside Publications. Books, articles, pamphlets, brochures, speeches, lectures, illustrated tables, and visual presentations or drawings prepared by Geological Survey personnel as a result of Survey work require advance approval of the Director. Procedures to be followed in obtaining such approval are governed by Chapter 7, Part 387 of the Survey Manual, and Chapter 1, Part 478 of the Departmental Manual. In compliance with such requirements, field geologists planning to make such presentations will submit in quadruplicate Form 9-1185, "Notice of Intention and Certificate of Compliance - Nonofficial Expression" (Exhibit 9). If any of the material is to be published, it shall be transmitted to the Branch Chief in duplicate after submittal to the Geologic Names Committee and the Branch Publications Unit in Denver for clearance. It will then be handled for Branch, Division, and Director's approval.

SUMMARY REPORT ON ACTIVE PROJECTS

FOR MONTH ENDING February 28 , 19 62

22422

PROJECT	DATE STARTED	STATUS—PERCENT COMPLETE			SQUARE MILES		
		FIELD WORK	OFFICE WORK		MAPPED		TOTAL ACTIVE AREA
			MAP	REPORT	DURING MONTH	TO DATE	
<u>Rocky Mountain Region</u>							
MC-029 Geology of Driggs SW quadrangle, Idaho -- Cressman and Pampeyan	July 1960	100	90	0	--	55	55
MC-030 Geology of Garns Mountain SE quadrangle, Idaho -- Staatz and Albee	July 1960	100	95	20	--	55	55
MC-032 Geology of Paradise quadrangle, Utah -- Mullens and Izett	July 1960	100	100	97	--	66	66

Feb. 1961
Page 11

9-314

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
PRODUCING OIL AND GAS STRUCTURES

[Defined as required by the act of February 25, 1920 (41 Stat., 437).]

[REDACTED] AND THE 1ST OF FEBRUARY 20, 1920 (41 Stat., 457).]								
STATE	No.	NET AREA DEFINED PRIOR TO	No.	AREAS DEFINED DURING	No.	AREAS ELIMINATED DURING	No.	EXISTING NET AREA
		Acres		Acres		Acres		Acres

9-
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUMMARY OF OUTSTANDING MINERAL WITHDRAWALS AND CLASSIFICATIONS

STATE	COAL		OIL		OIL SHALE		PHOSPHATE		POTASH
	WITHDRAWN	CLASSIFIED AS COAL LAND	WITHDRAWN	CLASSIFIED AS OIL LAND	WITHDRAWN	CLASSIFIED AS OIL SHALE LAND	WITHDRAWN	CLASSIFIED AS PHOSPHATE LAND	WITHDRAWN
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Alaska									
Arizona									
Arkansas									
California									
Colorado									
Florida									
Idaho									
Louisiana									
Montana									
Nevada									
New Mexico									
North Dakota									
Oregon									
South Dakota									
Utah									
Washington									
Wyoming									
TOTAL									

Brett - Int. 3993



DEPARTMENT OF THE INTERIOR INFORMATION SERVICE

GEOLOGICAL SURVEY

For Release to FM's, SEPTEMBER 19, 1960

SALINE ROCKS OF SOUTHEASTERN UTAH AND SOUTHWESTERN COLORADO STUDIED

A Geological Survey technical report on the salt-bed portion of certain oil- and potash-producing strata of the Paradox basin of southeastern Utah and southwestern Colorado is available now for public reference, the Department of the Interior announced today.

The Paradox member of the Hermosa formation of Pennsylvanian age has an extensive saline section consisting of 29 known salt beds separated by thin interbeds of other sedimentary rocks. Each salt bed consists of a sedimentary deposit representing a partial or complete evaporation cycle. A preliminary system of nomenclature is proposed for the "saline facies" and an accompanying diagram shows the correlation of this system through the salt basin. This information will provide detailed stratigraphic control for petroleum exploration and more precise correlations of potash-bearing strata.

Studies of the depositional history of the salt beds show that evaporite deposition was greatly influenced by structurally formed bottom topography. Surface features referred to today as salt anticlines and containing great thicknesses of halite rock were depositional troughs through most of the time of salt deposition.

The report titled, "The stratigraphy of the saline facies of the Paradox member of the Hermosa formation of southeastern Utah and southwestern Colorado," by Robert J. Hite, may be inspected at the following places: Geological Survey Library, 1033 GSA Building, Washington, D. C.; Room 1329, Building 25, Federal Center, Denver, Colorado; 468 New Customhouse, Denver, Colorado; 504 Federal Building, Salt Lake City, Utah; 602 Thomas Building, Dallas, Texas; 345 Middlefield Road, Menlo Park, California.

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Brett - 3993

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON, D. C.

For Release JULY 31, 1959.

The Geological Survey is releasing in open files the following map. Copies are available for consultation in the Geological Survey Library, 1033 General Services Building, Washington, D. C., and at the Geological Survey Public Inquiries Office, 468 New Customhouse, Denver, Colorado. Copies from which reproductions can be made at private expense are available at 468 New Customhouse Building, Denver, Colorado.

Geologic and Structure Map of the Glenrock Area,
Natrona and Converse Counties, Wyoming, by
E. G. Cserna and R. L. Rioux. 1 map. Scale 1:48,000.
Area 398 square miles.

x x x

June 11, 1957

Memorandum:

To: Chief Geologist

From: Chief, Conservation Division

Subject: Publication of the Branch of Mineral Classification maps and reports

At the meeting in your office on May 27, 1957 attended by Messrs. Finley and Miller, I understand that tentative agreement was reached on the publication of certain maps and reports prepared by members of the Branch of Mineral Classification.

Normally, the Branch of Mineral Classification geologists cannot devote the time necessary for preparation of bulletins or professional papers; nevertheless, publications should not be barred to them. It should be understood, however, that some of the lands investigated may be in areas where topographic map coverage is inadequate or lacking at the time geologic mapping for classification is required. In that event, mapping will be carried out by plane table or by photogrammetric methods. We hope to proceed with the mapping, classification, and restoration of withdrawn areas more rapidly than we have in the past.

In a discussion of the results of the May 27 conference, it was concluded that prior to embarking on an extensive program of classification of withdrawn lands and the possible publication of the results of mapping, it might be advisable to review the primary objectives and responsibilities of the Mineral Classification Branch. I, therefore, referred to the latest extensive official statement regarding the functions of the Branch and I find there has been no pronouncement since the memorandum for the Director, dated November 2, 1943, by Hale B. Soyster, Chief of the Conservation Division (then Branch). This memorandum, approved by Director Wrather, November 3, 1943, among other things provided for expansion of the Branch and the establishment of regional offices to supply more geologic data and assistance to engineers in the Oil and Gas Leasing, Mining, and Water and Power Branches.

The memorandum of November 2, 1943, further states in part that ". . . in addition to the service function to the other Divisions (now Branches) the geologist will determine geologic feasibility of dam sites, will furnish geologic advice and information to operators on public and Indian lands and to representatives of the Office of Indian Affairs . . . , and will prepare for publication maps and reports describing the results of some of the geological investigations. . . .

"The Mineral Classification Division (now Branch) personnel will make geological surveys and investigations of individual properties, entire fields, and restricted areas and prepare and maintain with frequent revision, in accordance with the results of drilling, structure-contour maps of fields and entire areas, and will in concert with the Oil and Gas Leasing Division (now Branch) engineers, prepare isopach maps, provide interpretations of well logs, well cuttings, cores, etc."

In order that proper preliminary planning may be undertaken for land classification projects, some of which may subsequently be proposed for publication, it is understood that the following conditions shall govern:

1. That the Chief of the Mineral Classification Branch will first submit to the Program Review Board, Geologic Division, project proposals in order to avoid overlapping projects and to alert other Divisions in the Survey of the work planned. It is assumed that there will be a mutual exchange of information between Divisions concerned with the same area to avoid duplication of effort and conflicting interpretations.
2. That mapping will be planned, as appropriate, on a quadrangle basis as such areas contribute toward the completion of areal geologic maps within the United States and are a more convenient form for eventual publication.
3. That the geologic maps prepared by geologists of the Branch may be published provided they meet Geological Survey standards for the class of publication applicable.
4. That any map or text intended for Survey publication will be given careful technical review and submitted before final drafting to the Staff Geologist for Publications, Geologic Division. He will decide the proper map series or type of publication suitable for the material submitted and forward it to the Geologic Names Committee and the Geologic Map Editors.
5. That the geologists will map areas withdrawn for leasable minerals, including dam sites on public lands, as rapidly as appropriations and personnel permit, and the results will be published, provided these maps conform to Survey standards.
6. That all mapping by the Branch will be directed primarily to investigations of Federal and Indian lands and will be to the scale or size best suited for that purpose.
7. That if and when circumstances justify, a text may be prepared to accompany the map, and both may be published, perhaps in bulletin form, provided they conform to Survey standards for such publication. Under certain conditions text may accompany a map included in a map series.

It is understood that this agreement between the Geologic and Conservation Divisions shall become effective upon approval by the Director.

I concur: /s/ W. H. Bradley 6/20/57
Chief Geologist

Approved: /s/ Nolan 6/21/57
Director

/s/ H. J. Duncan



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON 25, D. C.

Exhibit 7 (2 pages)
Part 619, Chapter 2

April 8, 1961

Memorandum

To: All Mineral Classification Professional Personnel

From: Chief, Branch of Mineral Classification

Subject: A system for manuscript processing in the Branch of Mineral Classification

The Branch's expanded mapping program and resulting increase in completed investigations suitable for publication requires a control system for processing manuscripts intended for publication. We have received comments and suggestions from several Branch members which have been reviewed by the Geologic Map Editor and Staff Geologist for Publications in the Geologic Division. Valuable suggestions were made by the reviewers based on Branch needs.

Our primary objective is the establishment of a working system for processing submittals for publication using existing personnel insofar as possible, delaying any additional recruiting until volume increase or work load justifies expansion. It is not our intention to establish a complete organization final in all detail, at this time.

Robert L. Rioux has heretofore been designated the geologic map editor for the Branch on a part time basis in the Denver office. (Memorandum to all Regional Geologists dated December 16, 1960.) This authorization is continued, expanded to include all manuscript and processing work, and for the present considered to be Branchwise for manuscripts and maps submitted for Survey publication, outside publication, or open file release.

You are therefore directed to observe the following procedures in regard to maps and manuscripts intended for publication.

1. Technical review, first in region or Division, then in Geologic Division or Water Resources Division, if necessary.
2. Thorough editing by the manuscript processors in Denver, and revision when required prior to transmittal in final form to Washington office.

3. Final approval by Geologic Names Committee in Denver unless special decisions on stratigraphic changes are required in which event the manuscript will be sent to the Survey's Map Editor.

4. Further examination in Washington office of Branch to ascertain if manuscript shall be sent forward.

5. Final review by the Board of Geographic Names in Washington.

6. Review by Survey's Geologic Map Editor and recommendation for proper map series.

7. Budgetary clearance and approval by Branch Chief.

8. Approval by Division Chief.

9. Approval by Director.

If the volume of work justifies it and appropriations permit, this map processing unit will become a permanent part of the organizational structure with the Director's approval.

/s/ J. C. Miller
J. C. Miller

November 17, 1961

Memorandum

To: Branch Authors

From: Branch Geologic Map Editor

Subject: Routing and processing of manuscripts prior to submittal
to the Publications Division

In order to implement the Branch Chief's memorandum of April 8, 1961, establishing "A System for Manuscript Processing in the Branch of Mineral Classification", the following routing procedures and processing forms (enclosures) are being adopted on a trial basis. Following adequate trial, these procedures and forms will be modified, as necessary. Your criticism of these trial procedures and forms is invited.

(1) Author

Follows format for publication series approved by Branch Chief on project description forms.

Prepares originals of illustrations insofar as practical on stable-base materials using proper line weights and latest drafting and compilation techniques. Branch of Technical Illustrations offices furnish advice on such matters. For those offices not having direct access to a BTI office, an illustrator in our Denver office will furnish the necessary liaison and supply information regarding base map materials, requirements, and techniques. All authors are urged to discuss problems of suitable base map materials and techniques with their illustrators. Every effort should be made by all authors to present their material for publication in as final a form as practical to keep the amount of preparation by BTI to a minimum. This will not only help to reduce publication costs, but will also speed up the publication process. We will attempt to use author's copy for publication wherever possible.

Utilizes the latest revision of "Geologic Map Symbols" (September, 1960, at present) and "Preparation of Illustrations" as these become available.

Follows usage established in "Suggestions to Authors" (S.T.A.) and in the new code on stratigraphic nomenclature prepared by the American Commission on Stratigraphic Nomenclature (May, 1961).

Consults with nearest office of the Geologic Names Committee (Menlo Park, Calif.; Federal Center, Denver, Colo.; Washington, D.C.) regarding any problems of nomenclature and age designation that arise in the preparation of manuscripts, and for a pre-edit of map explanations if special problems exist.

Clears new or controversial geographic names used through the Board on Geographic Names.

Retains originals of illustrations and negatives of photographs until requested.

Submits materials to the supervisor as outlined in the "Transmittal Check List" (items 3-14), and signs the "Manuscript Review and Approval Sheet".

(2) Supervisor

Field checks project area if necessary.

In consultation with author assigns at least two critics within the Division (one of which may be the supervisor) for a written technical review of the manuscript.

After return of the comments of the technical review the supervisor sends the manuscript to the author for consideration of the reviewers comments as outlined in "Transmittal Check List" (items 1-2). After revision the supervisor completes the "Transmittal Check List" (items 1-15), and submits the material to:

Branch Publications Unit
Branch of Mineral Classification
Conservation Division
U.S.G.S., Bldg. 25, Federal Center
Denver 25, Colorado

(3) Branch Publications Unit (BPU)

Assigns a serial number to each publication for control purposes. The status of manuscripts being processed will be reported under the monthly report of the Denver office.

Arranges on a credit basis with the Geologic Division APU for Survey technical review outside the Division if the supervisor has indicated that this is desirable.

Texts are checked by the manuscript processor and all illustrations are reviewed by the Branch Geologic Map Editor to the extent defined by the Survey's Geologic Map Editor under "Responsibilities for Geologic Map Editing in the Geological Survey". (May 29, 1961).

Minor revisions in typing and drafting will be handled at this time utilizing personnel in the Denver office. Substantial revisions, however, will be returned to the appropriate Regional office for either typing or drafting.

Maintains records of technical reviews and reviewers, manuscripts, and a control system for all materials being processed for publication.

Furnishes advice to authors regarding the processing steps, style, and format of manuscripts, and supplies information regarding standards, policy, and cost of Survey publications.

Provides liaison with Publication Division offices at Denver with regard to procedures, editing, and routing of final proof and copy for Branch manuscripts.

Provides for formal clearance with the field office of the Geologic Names Committee; upon completion of review and any necessary revision.

Indicates additional clearance needed in Washington area from other Divisions or Bureaus.

(4) Branch Headquarters

Clearance through Chairman, Geologic Names Committee, Wash., D. C., if special decisions are required that will not be handled by the GNC field office at Denver.

Clearance of paleontologic identifications or other data reported on by personnel stationed in the Washington area when indicated.

Clearance with the Board on Geographic Names or other bureaus if necessary.

Examination to ascertain that data for township reports and classification actions as necessary have been submitted.

Further examination to ascertain if manuscript shall be sent forward.

Liaison with Division, Director, and Publication Division offices in Washington in connection with the processing and routing of Branch manuscripts.

Liaison with the Survey's Geologic Map Editor and the Branch Geologic Map Editor.

Personnel involved sign the route sheet.

Forwards manuscript to Survey's Geologic Map Editor.

(5) Survey Geologic Map Editor

Reviews illustrations for conformance with Geological Survey publication standards and policies.

Provides for uniform review of author's copy.

Makes recommendations as to the proper map series for publication, alternate scales, satisfactory reductions, and alternate illustrative techniques.

Provides for training and consultive services to the Branch Geologic Map Editor.

Furnishes advice on problems and questions on illustrations that are not resolved between BTI and the Branch Geologic Map Editor, and makes final review of proof and all completed illustrations in order to maintain uniform map and illustration standards.

Returns illustrations to Branch Geologic Map Editor to note suggestions and discuss changes.

(6) Branch Geologic Map Editor

Notes suggestions and changes for training purposes.

Provides for revision of originals of manuscript by return to author in accordance with the comments of the Survey Geologic Map Editor. Author retains originals until requested by Branch Geologic Map Editor or Branch Headquarters.

Forwards revised manuscript to Branch Chief.

(7) Branch Chief

Budgetary clearance and approval.

(8) Division Chief

Approval

(9) Director

Approval

- (10) Branch Headquarters - Returns manuscript to BPU if any changes are made during the preceding 3 steps prior to transmitting materials to the Publication Division, in order that the originals may be revised.

This routing and processing may be modified to serve the needs of any particular case and only those steps that are pertinent would be used. For open-file reports and outside publication an abbreviated process may be used, which must, however, include review by the Geologic Names Committee except for school theses.

Robert L. Rioux

Enclosures

Manuscript Review and Approval Sheet
Manuscript Check List
Check List for Illustrations and Maps
Transmittal Check List

Title of report and Author

Br. Serial No.

BRANCH OF MINERAL CLASSIFICATION
MANUSCRIPT CHECK LIST

(To be completed by author or supervisor where applicable)

It is the duty of the author, the reviewers, and finally of the supervisor to see that all manuscripts, with accompanying illustrations, conform to Survey requirements for completed manuscripts before they are transmitted for processing. The following check list compiled primarily from similar check lists in use in the Geologic Division is furnished for convenience in making a check of important points. Please initial those points that have been checked.

1. Typist is familiar with STA p. 218-220 and the following points have been checked for any text.
 - (a) Typed on one side of fairly heavy bond paper (8x10½ inches) with 1-inch margin on all sides.
 - (b) Everything typed double or triple spaced, without strike-overs.
 - (c) Pages are numbered at the bottom (first page of abstract is page 1).
 - (d) Paragraphs are typed complete on the page (if a single paragraph will not fit on one page it may be continued on the following page, but the next paragraph must be started on a new page).

2. The requirements of a well prepared manuscript as outlined in STA p. 18-20 have been observed.

3. Title page with statement of cooperation, if necessary, and a short descriptive statement for book reports.

4. Table of contents headed "Contents" - - the manuscript pages on which headings appear are indicated, and the Table of contents and center heads agree.

5. Short list of illustrations headed "Illustrations - - short list" (follows the table of contents in the published report and is to be a short title containing only enough information to identify the illustration and differentiate it from the other illustrations). Pages that contain the principal references to the illustrations are indicated.

(1)

(2)

(3)

6. Long list of illustrations headed "Illustrations - - long list" (contains the complete titles and explanatory matter that is not included on the illustrations themselves). Pages that contain the principal references to the illustrations are indicated.

7. List of tables headed "Tables" (includes all numbered tables with an indication of the manuscript pages on which the tables are to appear).

8. Title and author appear at top of page 1 of text above abstract.

9. Abstract (for book reports) - See STA p. 26-28.

10. Headings (report is arranged with not more than 5 orders of center headings and 1 order of italic side headings - italic to be underscored, and side headings do not appear in the table of contents; the relative rank of the headings is indicated by indentation in the table of contents; headings are all typed as "Cap and lower case").

11. Quotations and personal communications are double or triple spaced and have been verified and initialed by the author.

12. The beginning and end of each extract are clearly indicated by quotation marks.

13. "Personal" communications are changed to "oral" or "written" communication and dated.

14. Citations of publications have been verified and initialed by the author and are in the form prescribed in STA p. 105-122.

15. Theses are cited in footnotes, and manuscripts in preparation are cited as "written communications".

16. Acknowledgments - see STA p. 28 for treatment.

17. Reserves - see STA p. 58-62 for requirements.

18. Tables and descriptions of measured sections are typed double spaced, with appropriate headings, and are inserted in the manuscript immediately after the part of the text that they should follow when printed, and are paged accordingly.

19. Boxheads are repeated on following pages of tables and analyst's names have been placed in a headnote at top of table.

20. Summation or footing of every column of figures is correct.

21. Reasons have been supplied for use of trade names.

22. Two sets of unmarked glossy prints of photographs for review - negatives to be retained with originals of illustrations until requested.

23. Photographs are mounted on 8½x10 inch bond paper or cardboard with gummed photo corners or in slits cut through the mounting paper.

24. Overlays of transparent paper pasted on one edge of the print containing reference marks (ticks), explanatory matter to be drafted on photo, and crop lines are supplied where needed; features to be emphasized on the photographs should be noted on the overlay.

25. Illustrations are all called figures except the plates that show groupings of photographs or drawings of fossils.

26. Illustrations are not included with text, but are enclosed in separate envelopes or packages.

27. All illustrations are essential; all are referred to in the text.

28. Illustrations are numbered consecutively in the order of their principal reference and illustration numbers agree with text references.

29. For book reports, the illustration number, long title of the illustration, and any explanatory matter that is not included in the illustration is inserted in the text, double spaced, immediately adjacent to its principal reference, and set off from the text by lines about one inch long, above and below the long title and explanatory matter on the left side of the page.

30. Places referred to in the text also appear on maps, and other illustrations where pertinent, and illustrations show what text says they show.

Title of report and Author

Br. Serial No.

BRANCH OF MINERAL CLASSIFICATION
TRANSMITTAL CHECK LIST FOR
AUTHORS AND SUPERVISORS

(To be completed by supervisor and forwarded to
BPU Denver, with submittals for publication)

1. Illustrations and/or text have been reviewed and criticized within the Branch and two copies of the comments of such technical review and any pertinent correspondence are enclosed. _____
2. All revisions necessitated by technical review, that are acceptable to author and supervisor, have been initialed and dated as appropriate action is taken and have been made on the originals and on review copies submitted. _____
3. Two review copies are enclosed (two prints of illustrations; one colored-out print for illustrations that are to be differentiated by pattern or color - original and one carbon for texts). Review copy contains all revisions made on originals of illustrations and revised text after technical review. _____
4. Text and/or illustrations are clean and legible. _____
5. Originals of illustrations are filed together and are available on request to: _____

Name

Address

6. Where linework for illustrations is not clear on review prints, (for example: if the faults and contacts, or the dashing of line work are not clearly differentiated, or special cartographic problems exist) supply a print and indicate beside the line work by various colored pencils, with a color-key, the nature of the linework. This print should be entitled "Guide to Illustrators" and will be used by BTI for any line work they do for us and also be useful in editing. _____

7. A layout sheet, for maps that include several illustrations or text matter, simply indicating the arrangement of the components as desired. _____
8. All illustrations have attached to them one copy of "Check List For Illustrations and Maps" and gives information as to final publication scale, colors, etc., for use by BTI in drafting final copy. _____
9. Transmittal letter (original and 1) to BPU by supervisor is enclosed which states the recommended form of publication, a brief evaluation of the manuscript, and any other comments desired. The supervisor should indicate at this time any additional clearance required (P&S, G&P Branches, etc.) or additional technical review necessary outside the Division and the critics desired. _____
10. "Manuscript Review and Approval Sheets", (original and 1) original to be signed by all reviewers. _____
11. Press release enclosed - See S.T.A. p. 224-225 (original and 2; typed double spaced). _____
12. Note for monthly list (original and 2; typed double spaced; 75 words or less). _____
13. Copy of "Manuscript Check List" if there is a text. _____
14. If new geographic names are proposed or questionable names encountered, the appropriate form for "Proposal of Name For an Unnamed Domestic Feature", or "Report on Controversial Names" has been submitted to the Board on Geographic Names, Washington, D. C., and copies of correspondence indicating that clearance has been obtained are enclosed. _____
15. Completed copy of this check list. _____

CONSERVATION DIVISION MANUSCRIPT REVIEW AND APPROVAL SHEET

TYPE OF PUBLICATION

BRANCH PROJECT NO.

AUTHOR(S)

TITLE

NO. OF PAGES

NO. OF ILLUSTRATIONS

NO. OF TABLES
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CHECK LIST FOR ILLUSTRATIONS AND MAPS

This form to be completed by author and attached to manuscript copy of each drafted illustration for Geological Survey publication before report is submitted to supervisor.

DIVISION _____ BRANCH _____ SERIAL NO. _____

AUTHOR _____

BRIEF TITLE OF REPORT _____

ILLUSTRATION NO. AND BRIEF TITLE _____

FORM OF PUBLICATION
(Circle one)Book series:
Map series:Prof. Paper
GQ MF MR MIBulletin
HA GP OM OCWater Supply Paper
C

Circular

Outside

Scale or size of attached print _____

Scale or size of original compilation _____

(Original should be at 1:1 or, at most, 25% larger than publication scale)

Recommended publication scale or size _____

Recommended publication colors

Red road fill and land net ☐BASE: Multicolor (culture-land net, drainage, topo) ☐ Gray road fill ☐Topo base composite ☐: Screen ☐ Black ☐ Brown ☐ Blue ☐ Other _____Planimetric base composite ☐: Screen ☐ Black ☐ Blue ☐ Other _____DATA: Black and white ☐ Black and one other color ☐ Multicolor ☐Use colors on attached colored-out copy ☐ Match adjacent published or approved map ☐ Reference: _____

Indicate map units to be emphasized and colors preferred for these units _____

Original illustration compiled on

Plastic ☐ Scribe ☐ Metal mount ☐ Cloth ☐ Paper ☐ Other _____

Original illustration in _____ pieces

Original illustration held by _____

Location _____

Has this illustration or map been published previously? _____ If so, give complete reference _____

If published in copyrighted book or journal has permission to publish been received? ☐

Will this illustration or map be used in a later publication in same or modified form? _____

If modified, indicate type of publication, scale, and color requirements _____

Do you have reproducible base material? _____ Scale _____

Color separated ☐ Composite ☐ Positive ☐ Negative ☐

What base map material is available from other sources? _____

Base map material in Publications Division: MRB ☐; BTI in Wash. ☐ Denver ☐Menlo Park ☐ Kentucky ☐

Size, in inches, of illustrations in book publications

Bulletin and Water Supply Paper
4-3/8 by 6 1/2 (bottom title)
4 by 7 (side title)

Professional Paper

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3. Form of expression (article, lecture, etc.).	4. Approx. date of completion.
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UNITED STATES
DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

Changes in geologic nomenclature, January 1, 1963 to June 30, 1963

I. NEW NAMES PROPOSED AND ADOPTED FOR OFFICIAL USE IN THE U. S. GEOLOGICAL SURVEY

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Report in which New name was proposed</u>	<u>Used in</u>
Al Rose Formation (of Mazourka Group)	Early Ordovician	Calif.	Mazourka Group of Early and Middle Ordovician age in the Independence quadrangle, Inyo County, California, by D. C. Ross	Annual Review 1963
Bachelor Mountain Rhyolite	middle or late Tertiary	Colo.	A revised volcanic sequence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Badger Flat Limestone (of Mazourka Group)	Middle Ordovician	Calif.	Mazourka Group of Early and Middle Ordovician age in the Independence quadrangle, Inyo County, California, by D. C. Ross	Annual Review 1963
Bell Brook Formation	Silurian(?) and Devonian(?)	Maine	Geology of the Bridgewater quadrangle, Aroostook County, Maine, by Louis Pavlides	Prof. Paper or Bulletin
Big Pole Formation (of Pony Trail Group)	Mesozoic	Nev.	Geology of the Frenchie Creek quadrangle, north-central Nevada, by L. J. P. Muffler	Bulletin
Canyon Mountain Complex	Early and Middle Triassic	Ore.	The Canyon Mountain Complex, Oregon, and the alpine mafic magma stem, by T. P. Thayer	Annual Review 1963

NEW NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Report in which New name was proposed</u>	<u>Used in</u>
Chiapuk Rhyolite	late(?) Mesozoic	Ariz.	Mesozoic formations in the Vekol Mountains, Papago Indian Reservation, Arizona, by L. A. Heindl	Annual Review 1963
Chiputneticook Quartz Monzonite	Devonian	Maine	Geologic map and section of the Kellyland and Vanceboro quadrangles, Maine, by D. M. Larrabee	I Map Series
Daggett Ridge Formation	Silurian	Maine	Geologic map and section of the Kellyland and Vanceboro quadrangles, Maine, by D. M. Larrabee	I Map Series
Dimple Dell Soil	Pleistocene	Utah	Lake Bonneville: Quaternary stratigraphy of eastern Jordan Valley south of Salt Lake City, Utah, by R. B. Morrison	Prof. Paper
Draper Formation (of Lake Bonneville Group)	Pleistocene	Utah	Lake Bonneville: Quaternary stratigraphy of eastern Jordan Valley south of Salt Lake City, Utah, by R. B. Morrison	Prof. Paper
Farmers Creek Rhyolite	middle or late Tertiary	Colo.	A revised volcanic sequence in the San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Fenton Pass Formation	Pleistocene(?)	Wyo.	Fenton Pass Formation, Bighorn Basin, Wyoming, by W. L. Rohrer and E. B. Leopold	Annual Review 1963
Fitz Creek Siltstone (of Tuxedni Group)	Middle Jurassic	Alaska	Revised stratigraphic nomenclature and age for the Tuxedni Group in the Cook Inlet region, Alaska, by R. L. Detterman	Annual Review 1963

NEW NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Report in which New name was proposed</u>	<u>Used in</u>
Frenchie Creek Rhyolite (of Pony Trail Group)	Mesozoic	Nev.	Geology of the Frenchie Creek quadrangle, north-central Nevada, by L. J. P. Muffler	Bulletin
Gilpin Peak Tuff (of Potosi Volcanic Group)	middle and late Tertiary	Colo.	Tertiary volcanic stratigraphy in the western San Juan Mountains, Colorado, by R. G. Luedke and W. S. Burbank	Annual Review 1963
Graniteville Soil	Pleistocene	Utah	Lake Bonneville: Quaternary stratigraphy of eastern Jordan Valley south of Salt Lake City, Utah, by R. B. Morrison	Prof. Paper
Grier Limestone Member (of Lexington Lime- stone)	Middle Ordovician	Ky.	Geology of the Tyrone quadrangle, Kentucky, by E. R. Cressman	GQ Map Series
Horseshoe Mesa Member (of Redwall Lime- stone)	Mississippian	Ariz.	Nomenclature for lithologic subdivisions of the Mississippian Redwall Limestone, Arizona, by E. D. McKee	Annual Review 1963
Katak Glaciation	Recent	Alaska	Quaternary Geology of the Mt. Chamberlin area, Brooks Range, Alaska, by G. W. Holmes and C. R. Lewis	Bulletin
Kellyland Formation	Silurian(?)	Maine	Geologic map and section of the Kellyland and Vanceboro quadrangles, Maine, by D. M. Larrabee	I map Series
Kootznahoo Formation	Eocene and Oligocene	Alaska	Reconnaissance geology of Admiralty Island, Alaska, by E. H. Lathram, J. S. Pomeroy, H. C. Berg, and R. A. Loney	Bulletin

NEW NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Report in which New name was proposed</u>	<u>Used in</u>
La Garita Quartz Latite	middle or late Tertiary	Colo.	A revised volcanic sequence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Lead Gulch Formation	Late Cambrian	Calif.	New Upper Cambrian formations in the Independence quadrangle, Inyo County, California, by D. C. Ross	Annual Review 1963
Little Cottonwood Formation (of Lake Bonne- ville Group)	Pleistocene	Utah	Lake Bonneville: Quaternary stratigraphy of eastern Jordan Valley south of Salt Lake City, Utah, by R. B. Morrison	Prof. Paper
Luce Gravel	Pliocene	Ind. and Ky.	Geomorphology and Quaternary geology of the Owensboro quadrangle, Indiana and Kentucky, by L. L. Ray	Prof. Paper
Midvale Soil	Pleistocene	Utah	Lake Bonneville: Quaternary stratigraphy of eastern Jordan Valley south of Salt Lake City, Utah, by R. B. Morrison	Prof. Paper
Mooney Falls Member (of Redwall Lime- stone)	Mississippian	Ariz.	Nomenclature for lithologic subdivisions of the Mississippian Redwall Limestone, Arizona, by E. D. McKee	Annual Review 1963
Parleys Member (of Kelvin For- mation)	Early Cretaceous	Utah	Emendation of Kelvin Formation and Morrison(?) Formation near Salt Lake City, Utah, by M. D. Crittenden, Jr.	Annual Review 1963
Phonodoree Formation	late(?) Mesozoic	Ariz.	Mesozoic formations in the Vekol Moun- tains, Papago Indian Reservation, Arizona, by L. A. Heindl	Annual Review 1963

NEW NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Report in which New name was proposed</u>	<u>Used in</u>
Pony Trail Group	Mesozoic	Nev.	Geology of the Frenchie Creek quadrangle, north-central Nevada, by L. J. P. Muffler	Bulletin
Rainstorm Member (of Johnnie Formation)	late Precambrian	Nev.	Geologic map of Jangle Ridge, Nye County, Nevada, by H. Barnes, R. L. Christiansen and F. M. Byers, Jr.	GQ Map Series
Red Glacier Formation (of Tuxedni Group)	Middle Jurassic	Alaska	Revised stratigraphic nomenclature and age for the Tuxedni Group in the Cook Inlet region, Alaska, by R. L. Detterman	Annual Review 1963
St. Kevin Granite	Precambrian	Colo.	St. Kevin Granite, Sawatch Range, Colorado, by Ogden Tweto and R. C. Pearson	Annual Review 1963
Shallow Creek Quartz Latite	middle or late Tertiary	Colo.	A revised volcanic sequence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Snowshoe Mountain Quartz Latite	middle or late Tertiary	Colo.	A revised volcanic sequence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Sod House Tuff (of Pony Trail Group)	Mesozoic	Nev.	Geology of the Frenchie Creek quadrangle, north-central Nevada, by L. J. P. Muffler	Bulletin
Stephens Passage Group	Late Jurassic and Early Cretaceous	Alaska	Reconnaissance geology of Admiralty Island, Alaska, by E. H. Lathram, J. S. Pomeroy, H. C. Berg, and R. A. Loney	Bulletin
Sunday Canyon Formation	Silurian	Calif.	Silurian facies in the Independence quadrangle, Inyo County, California, by D. C. Ross	Annual Review 1963

NEW NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Report in which New name was adopted</u>	<u>Used in</u>
Tamarack Canyon Dolomite	Late Cambrian	Calif.	New Upper Cambrian formations in the Independence quadrangle, Inyo County, California, by D. C. Ross	Annual Review 1963
Thunder Springs Member (of Redwall Limestone)	Mississippian	Ariz.	Nomenclature for lithologic subdivisions of the Mississippian Redwall Limestone, Arizona, by E. D. McKee	Annual Review 1963
Twist Creek Siltstone (of Tuxedni Group)	Middle Jurassic	Alaska	Revised stratigraphic nomenclature and age for the Tuxedni Group in the Cook Inlet region, Alaska, by R. L. Detterman	Annual Review 1963
Vaughn Gulch Limestone	Silurian	Calif.	Silurian facies in the Independence quadrangle, Inyo County, California, by D. C. Ross	Annual Review 1963
Vekol Formation	late(?) Mesozoic	Ariz.	Mesozoic formations in the Vekol Mountains, Papago Indian Reservation, Arizona, by L. A. Heindl	Annual Review 1963
Wason Park Rhyolite	middle and late Tertiary	Colo.	A revised volcanic sequence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Whitmore Wash Member (of Redwall Limestone)	Mississippian	Ariz.	Nomenclature for lithologic subdivisions of the Mississippian Redwall Limestone, Arizona, by E. D. McKee	Annual Review 1963
Witts Springs Formation	Pennsylvanian (Morrow)	Ark.	Carboniferous cephalopods of Arkansas, by M. Gordon, Jr.	Prof. Paper

II. PREVIOUSLY USED NAMES ADOPTED FOR OFFICIAL USE BY THE U. S. GEOLOGICAL SURVEY

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Original Author</u>	<u>Report in which usage was adopted</u>	<u>Used in</u>
Akron Dolomite	Late Silurian	N. Y.	Grabau, 1909	The Helderberg Group and the position of the Silurian-Devonian boundary in North America, by J. M. Berdan	Bulletin
Apache Creek Sandstone Member	Late Cretaceous	Colo.	Mitchell, Greene, and Gould, 1956	Apache Creek Sandstone Member of the Pierre Shale of Colorado, by G. R. Scott and W. A. Cobban	Annual Review 1963
Argentine Limestone Member (of Wyandotte Limestone) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Newell, 1935	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Barrel Spring Formation	Middle Ordovician	Calif.	Phleger, 1933	Geology of the Independence quadrangle, Inyo County, California, by D. C. Ross	Bulletin
Block Limestone Member (of Cherryvale Formation) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Newell, 1935	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Canville Limestone Member (of Dennis Limestone) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Jewett, 1932	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper

PREVIOUSLY USED NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Original Author</u>	<u>Report in which usage was adopted</u>	<u>Used in</u>
Cherry Valley Limestone	Middle Devonian	N. Y.	Clarke, 1903	A new species of <i>Nalivkinella</i> from Middle Devonian of eastern Pennsylvania, by W. A. Oliver, Jr.	Jour. of Paleontology
Chrysler Limestone	Late Silurian and Early Devonian	N. Y.	Chadwick, 1930	The Helderberg Group and the position of the Silurian-Devonian boundary in North America, by J. M. Berdan	Bulletin
Clark Reservation Member (of Manlius Limestone) (of Helderberg Group)	Early Devonian	N. Y.	Smith, 1929	The Helderberg Group and the position of the Silurian-Devonian boundary in North America, by J. M. Berdan	Bulletin
Dayville Member (of Coeymans Limestone) (of Helderberg Group)	Early Devonian	N. Y.	Rickard, 1962	The Helderberg Group and the position of the Silurian-Devonian boundary in North America, by J. M. Berdan	Bulletin
Deansboro Member (of Coeymans Limestone) (of Helderberg Group)	Early Devonian	N. Y.	Rickard, 1962	The Helderberg Group and the position of the Silurian-Devonian boundary in North America, by J. M. Berdan	Bulletin
Devils Hollow Member (of Cynthiana Formation)	Middle Ordovician	Ky.	McFarlan and White, 1948	Geology of the Tyrone quadrangle, Kentucky, by E. R. Cressman	GQ Map Series

PREVIOUSLY USED NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Original Author</u>	<u>Report in which usage was adopted</u>	<u>Used in</u>
Elmwood Member (of Manlius Limestone) (of Helderberg Group)	Early Devonian	N. Y.	Smith, 1929	The Helderberg Group and the position of the Silurian- Devonian boundary in North America, by J. M. Berdan	Bulletin
Fontana Shale Member (of Cherryvale Formation) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Newell, 1935	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Frisbie Limestone Member (of Wyandotte Limestone) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Newell, 1935	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Furnace Limestone	Paleozoic	Calif.	Vaughan, 1922	Geologic map of the Lucerne Valley quadrangle, San Bernar- dino County, California, by T. W. Dibblee, Jr.	MF Map Series
Glasco Member (of Rondout Limestone)	Late Silurian	N. Y.	Chadwick, 1944	The Helderberg Group and the position of the Silurian- Devonian boundary in North America, by J. M. Berdan	Bulletin
Hay Ranch Formation	middle Pliocene to middle Pleistocene	Nev.	Regnier, 1960	Geology of the Frenchie Creek quadrangle, north-central Nevada, by L. J. P. Muffler	Bulletin

PREVIOUSLY USED NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Original Author</u>	<u>Report in which usage was adopted</u>	<u>Used in</u>
Island Creek Shale Member (of Wyandotte Limestone) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Newell, 1935	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Jamesville Member (of Manlius Limestone) (of Helderberg Group)	Early Devonian	N. Y.	Smith, 1929	The Helderberg Group and the position of the Silurian- Devonian boundary in North America, by J. M. Berdan	Bulletin
Johnson Spring For- mation	Middle Ordovician	Calif.	Pestana, 1960	Geology of the Independence quadrangle, Inyo County, California, by D. C. Ross	Bulletin
Kneeling Nun Rhyo- lite Tuff	Miocene(?)	N. Mex.	Kuellmer and others, 1953	Geologic map of the Santa Rita quadrangle, New Mexico, by R. M. Hernon, W. R. Jones, and S. L. Moore	GQ Map Series
Mazourka Group	Early and Middle Ordovician	Calif.	Phleger, 1933	Mazourka Group of Early and Middle Ordovician age in the Independence quadrangle, Inyo County, California, by D. C. Ross	Annual Review 1963
Olney Member (of Manlius Limestone) (of Helderberg Group)	Early Devonian	N. Y.	Smith, 1929	The Helderberg Group and the position of the Silurian- Devonian boundary in North America, by J. M. Berdan	Bulletin

PREVIOUSLY USED NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Original Author</u>	<u>Report in which usage was adopted</u>	<u>Used in</u>
Oxbow Dolomite	Late Silurian	N. Y.	Fisher, 1959	The Helderberg Group and the position of the Silurian-Devonian boundary in North America, by J. M. Berdan	Bulletin
Quindaro Shale Member (of Wyandotte Limestone) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Newell, 1935	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Quivira Shale Member (of Cherryvale Formation) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Newell, 1935	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Reeves Limestone Member (of Maitlen Phyllite)	Cambrian	Wash.	Fyles and Hewlett, 1959	Geologic map and sections, Deep Creek area, Stevens and Pend Oreille Counties, Washington, by R. G. Yates	I Map Series
Rossland Group	Jurassic	Wash.	Frebold and Little, 1962	Geologic map and sections, Deep Creek area, Stevens and Pend Oreille Counties, Washington, by R. G. Yates	I Map Series
Rubio Peak Formation	Miocene(?)	N. Mex.	Hernon, Jones, and Moore, 1953	Geologic map of the Santa Rita quadrangle, New Mexico, by R. M. Hernon, W. R. Jones, and S. L. Moore	GQ Map Series

PREVIOUSLY USED NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Original Author</u>	<u>Report in which usage was adopted</u>	<u>Used in</u>
Saragossa Quartzite	Paleozoic	Calif.	Vaughan, 1922	Geologic map of the Lucerne Valley quadrangle, San Bernardino County, California, by T. W. Dibblee, Jr.	MF Map Series
Sheppard Granite	Tertiary	Wash.	Daly, 1912	Geologic map and sections, Deep Creek area, Stevens and Pend Oreille Counties, Washington, by R. G. Yates	I Map Series
Stark Shale Member (of Dennis Limestone) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Jewett, 1932	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Sugarlump Tuffs	Miocene(?)	N. Mex.	Kuellmer and others, 1953	Geologic map of the Santa Rita quadrangle, New Mexico, by R. M. Hernon, W. R. Jones, and S. L. Moore	GQ Map Series
Thacher Member (of Manlius Limestone) (of Helderberg Group)	Early Devonian	N. Y., N. J., and Pa.	Richard, 1962	The Helderberg Group and the position of the Silurian-Devonian boundary in North America, by J. M. Berdan	Bulletin
Wea Shale Member (of Cherryvale Formation) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Newell, 1935	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper

PREVIOUSLY USED NAMES (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Original Author</u>		<u>Used in</u>
Westerville Limestone Member (of Cherryvale Formation) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Bain, 1898	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Whiteport Member (of Rondout Limestone)	Early Devonian	N. Y., N. J., and Pa.	Fisher, 1959	The Helderberg Group and the position of the Silurian-Devonian boundary in North America, by J. M. Berdan	Bulletin
Willimantic Gneiss	pre-Pennsylvanian	Conn.	Gregory, 1906	Bedrock geology of the Willimantic quadrangle, Connecticut, by G. L. Snyder	GQ Map Series
Zabriskie Quartzite	Early Cambrian	Calif.,	Hazzard, 1937	Geologic map of Jangle Ridge, Nye County, Nevada, by H. Barnes, R. L. Christiansen, and F. M. Byers, Jr.	GQ Map Series

III. NAMES REVISED

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Alboroto Rhyolite	middle or late Tertiary	Colo.	Rocks previously included in this unit in the western San Juan Mountains are included in the Sunshine Peak Rhyolite.	Tertiary volcanic stratigraphy in the western San Juan Mountains, Colorado, by R. G. Luedke and W. S. Burbank	Annual Review 1963

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Alpine Member (of Little Cotton- wood Formation) (of Lake Bonne- ville Group)	Pleistocene	Utah	Formerly Alpine For- mation of Lake Bonne- ville Group.	Lake Bonneville Quater- nary stratigraphy of eastern Jordan Valley south of Salt Lake City, Utah, by R. B. Morrison	Prof. Paper
Benton Shale	Early and Late Cretaceous	Colo.	Mowry Shale Member included in Benton Shale in report area.	Geology of northwestern North Park, Colorado, by W. J. Hall, Jr.	Bulletin
Bonanza King Dolomite	Middle and Late Cambrian	Calif.	Name Bonanza King Dolomite used in area of report. Bonanza King Formation used elsewhere.	Geology of the Independence quadrangle, Inyo County, California, by D. C. Ross	Bulletin
Bonneville Member (of Little Cotton- wood Formation) (of Lake Bonne- ville Group)	Pleistocene	Utah	Formerly Bonneville Formation of Lake Bonneville Group.	Lake Bonneville: Quater- nary stratigraphy of eastern Jordan Valley south of Salt Lake City, Utah, by R. B. Morrison	Prof. Paper
Bowser Formation (of Tuxedni Group)	Middle(?) and Late Jurassic	Alaska	The Bowser is re- stricted to the upper part of the former Bowser Member of the Tuxedni Formation and redefined as the Bowser Formation of the Tuxedni Group. Formerly of Middle Jurassic age.	Revised stratigraphic nomenclature and age for the Tuxedni Group in the Cook Inlet region, Alaska, by R. L. Detterman	Annual Review 1963

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Brothers Volcanics (of Stephens Passage Group)	Late Jurassic and Early Cretaceous	Alaska	Brothers Volcanics assigned to Stephens Passage Group.	Reconnaissance geology of Admiralty Island, Alaska, by E. H. Lathram, J. S. Pomeroy, H. C. Berg, and R. A. Loney	Bulletin
Burns Formation (of Silverton Volcanic Group)	middle and late Tertiary	Colo.	Formerly Burns Latite Tuff and Burns Quartz Latite of Miocene age.	Tertiary volcanic stra- tigraphy in the western San Juan Mountains, Colo- rado, by R. G. Luedke and W. S. Burbank	Annual Review 1963
Campbell Mountain Member (of Bachelor Moun- tain Rhyolite)	middle or late Tertiary	Colo.	Formerly Campbell Mountain Rhyolite of Miocene age.	A revised volcanic sequence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Carlile Shale (of Colorado Group)	Late Cretaceous	Colo.	Juan Lopez made a member of Carlile Shale in report area.	Geology of the Northwest and Northeast Pueblo quad- rangles, Colorado, by G. R. Scott	I Map Series
Cayuga Series	Late Silurian and Early Devonian	N. Y.	The Manlius Limestone is assigned an Early Devonian age and is placed in the Helderberg Group rather than in the Cayuga. The Silurian- Devonian boundary is in the Rondout Limestone, which thereby becomes Late Silurian and Early Devonian in age, as does the Cayuga Series.	The Helderberg Group and the position of the Silurian- Devonian boundary in North America, by J. M. Berdan	Bulletin

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Chilhowee Group	Cambrian and Cambrian(?)	Tenn.	Age of the Chilhowee Group remains Cambrian and Cambrian(?) but the boundary between the two ages is moved downward to the base of the Murray Shale, on fossil evidence.	Geology of the western Great Smoky Mountains, Tennessee, by R. B. Neuman and W. H. Nelson	Prof. Paper
Cortlandt Complex	Unknown	N. Y.	Formerly Cortlandt Series.	Reaction between mafic magma and pelitic schist, Cortlandt, New York, by Fred Barker	Am. Jour. Science
Curdsville Limestone Member (of Lexington Limestone)	Middle Ordovician	Ky.	Curdsville Limestone of Lexington Group reduced in rank to Curdsville Limestone Member of Lexington Limestone.	Geology of the Tyrone quadrangle, Kentucky, by E. R. Cressman	GQ Map Series
Curecanti Quartz Monzonite	Precambrian	Colo.	Formerly Curecanti Granite.	Curecanti pluton, unusual intrusive body in the Black Canyon of the Gunnison, Colorado, by W. R. Hansen	Bulletin
Cynthia Falls Sandstone (of Tuxedni Group)	Middle Jurassic	Alaska	Formerly Cynthia Falls Sandstone Member of Tuxedni Formation.	Revised stratigraphic nomenclature and age for the Tuxedni Group in the Cook Inlet region, Alaska, by R. L. Detterman	Annual Review 1963

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Dawson Formation	Late Cretaceous and Paleocene	Colo.	Dawson Formation in area of report. Dawson Arkose is used elsewhere.	Records of wells and test holes, water analyses, and physical properties of water-bearing materials for the Denver Basin, Colo- rado, by J. A. McConaghy, G. H. Chase, A. J. Boettcher, and T. J. Major	Basic Data Report
Dennis Limestone (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Iowa and Nebr.	Winterset Limestone Member placed in Dennis Limestone.	Geology of the Omaha- Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Dunn Brook For- mation	Ordovician(?) or Silurian(?)	Maine	Formerly Dunn Brook Member of Hovey For- mation.	Geology of the Bridge- water quadrangle, Aroostook County, Maine, by Louis Pavlides	Prof. Paper or Bulletin
Eureka Tuff (of Silverton Volcanic Group)	middle and late Tertiary	Colo.	Changed to Eureka Tuff (instead of rhyolite). Age changed from Miocene to middle and late Tertiary.	Tertiary volcanic stra- tigraphy in the western San Juan Mountains, Colo- rado, by R. G. Luedke and W. S. Burbank	Annual Review 1963
Gaikema Sandstone (of Tuxedni Group)	Middle Jurassic	Alaska	Formerly Gaikema Sand- stone Member of Tuxedni Formation.	Revised stratigraphic nomenclature and age for the Tuxedni Group in the Cook Inlet region, Alaska, by R. L. Detterman	Annual Review 1963

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Glen Dean Formation	Late Mississippian (Chester)	Ky.	Glen Dean Formation to be used in Hopkinsville-Princeton area, Kentucky. Elsewhere Glen Dean Limestone will be used.	Geology of the Kelly quadrangle, Kentucky, by T. P. Miller	GQ Map Series
Helderberg Group	Early Devonian	N. Y.	The Manlius Limestone is assigned an Early Devonian age and is included in the Helderberg Group. The Keyser Limestone is removed from the Helderberg Group.	The Helderberg Group and the position of the Silurian-Devonian boundary in North America, by J. M. Berdan	Bulletin
Henson Formation (of Silverton Volcanic Group)	middle and late Tertiary	Colo.	Formerly Henson Tuff of Miocene age. Now includes previously unnamed pyroxene-quartz latite.	Tertiary volcanic stratigraphy in the western San Juan Mountains, Colorado, by R. G. Luedke and W. S. Burbank	Annual Review 1963
Huerto Formation	middle and late Tertiary	Colo.	Huerto Formation used in report area. Elsewhere Huerto Quartz Latite is used.	A revised volcanic sequence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Juana Lopez Member (of Carlile Shale) (of Colorado Group)	Late Cretaceous	Colo.	Juana Lopez made a member of Carlile Shale in report area.	Geology of the Northwest and Northeast Pueblo quadrangles, Colorado, by G. R. Scott	I Map Series

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Kelvin Formation	Early Cretaceous	Utah	Kelvin Formation re- defined to include Parleys Member at base and an unnamed member above.	Emendation of Kelvin For- mation and Morrison(?) Formation near Salt Lake City, Utah, by M. D. Crittenden, Jr.	Annual Review 1963
Keyser Limestone	Late Silurian and Early Devonian(?)	Md. and W. Va.	The Keyser Limestone is removed from the Hel- derberg Group.	The Helderberg Group and the position of the Silurian- Devonian boundary in North America, by J. M. Berdan	Bulletin
Lake Bonneville Group	Pleistocene	Utah	Lake Bonneville Group redefined to include Draper Formation (top) and Little Cottonwood Formation (bottom).	Lake Bonneville: Quater- nary stratigraphy of eastern Jordan Valley south of Salt Lake City, Utah, by R. B. Morrison	Prof. Paper
Lexington Lime- stone	Middle Ordovician	Ky.	Formerly Lexington Group.	Geology of the Tyrone quad- rangle, Kentucky, by E. R. Cressman	GQ Map Series
Logana Member (of Lexington Limestone)	Middle Ordovician	Ky.	Logana Formation of Lexington Group re- duced in rank to Logana Member of Lexington Limestone.	Geology of the Tyrone quadrangle, Kentucky, by E. R. Cressman	GQ Map Series
McCarthy For- mation	Late Triassic and Early Jurassic	Alaska	Formerly McCarthy Shale of Late Triassic age.	Preliminary geologic map of the McCarthy C-5 quadrangle, Alaska, by E. M. MacKevett, Jr.	I Map Series

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Maitlen Phyllite	Early or Middle Cambrian	Wash.	Reeves Limestone Mem- ber made a member of Maitlen Phyllite.	Geologic map and sections, Deep Creek area, Stevens and Pend Oreille Counties, Washington, by R. G. Yates	I Map Series
Manlius Limestone (of Helderberg Group)	Early Devonian	N. Y.	The Manlius Limestone is placed in the Hel- derberg Group and is assigned an Early De- vonian age.	The Helderberg Group and the position of the Silurian- Devonian boundary in North America, by J. M. Berdan	Bulletin
Mowry Shale Member (of Benton Shale)	Early Cretaceous	Colo.	Mowry Shale made a member of Benton Shale in this area.	Geology of northwestern North Park, Colorado, by W. J. Hall, Jr.	Bulletin
Nelson Mountain Quartz Latite	middle or late Tertiary	Colo.	Nelson Mountain Quartz latite redefined and age changed from Mio- cene to middle or late Tertiary.	A revised volcanic sequence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Nussbaum Alluvium	Pleistocene(?)	Colo.	Formerly Nussbaum For- mation of Pliocene(?) age.	Nussbaum Alluvium of Pleis- tocene(?) age at Pueblo, Colorado, by G. R. Scott	Annual Review 1963
Ohio Creek For- mation	Paleocene	Colo.	Formerly Ohio Creek Conglomerate, includes the underlying con- glomeratic sandstone which Lee (1912) placed in the upper part of the Mesaverde Forma- tion.	Redefinition and corre- lation of the Ohio Creek Formation (Paleocene) in west-central Colorado, by D. Gaskill and L. Godwin	Annual Review 1963

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Outlet Tunnel Member (of La Garita Quartz Latite)	middle or late Tertiary	Colo.	Formerly Outlet Tunnel Quartz Latite of Mio- cene age.	A revised volcanic se- quence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Paint Creek Lime- stone	Late Missis- sippian (Chester)	Ky.	Paint Creek Limestone to be used in Hopkins- ville area, Kentucky. Paint Creek Shale or Paint Creek Formation good elsewhere.	Geology of the Kelly quadrangle, Kentucky, by T. P. Miller	GQ Map Series
Phoenix Park Member (of La Garita Quartz Latite)	middle or late Tertiary	Colo.	Formerly Phoenix Park Quartz Latite of Miocene age.	A revised volcanic se- quence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Picayune Formation (of Silverton Volcanic Group)	middle and late Tertiary	Colo.	Formerly Picayune Quartz Latite and Picayune Volcanic Group of Miocene age.	Tertiary volcanic stra- tigraphy in the western San Juan Mountains, Colo- rado, by R. G. Luedke and W. S. Burbank	Annual Review 1963
Pierre Shale	Late Cretaceous	Colo.	Apache Creek Sand- stone Member made a member of Pierre Shale.	Apache Creek Sandstone Member of the Pierre Shale of Colorado, by G. R. Scott and W. A. Cobban	Annual Review 1963

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Potosi Volcanic Group	middle and late Tertiary	Colo.	Formerly Potosi Vol- canic Series. Revised to include the Sun- shine Peak Rhyolite and Gilpin Peak Tuff in the western San Juan region.	Tertiary volcanic stra- tigraphy in the western San Juan Mountains, Colo- rado, by R. G. Luedke and W. S. Burbank	Annual Review 1963
Provo Member (of Little Cotton- wood Formation) (of Lake Bonne- ville Group)	Pleistocene	Utah	Formerly Provo For- mation of Lake Bonne- ville Group.	Lake Bonneville: Quater- nary stratigraphy of eastern Jordan Valley south of Salt Lake City, Utah, by R. B. Morrison	Prof. Paper
Quadrant Sand- stone	Pennsylvanian	Mont. and Wyo.	Quadrant Sandstone used in report area. Quadrant Formation or Quadrant Quartzite to be used elsewhere.	Preliminary geologic map of the Tepee Creek quad- rangle, Montana-Wyoming, by Irving Witkind, as- sisted by C. E. Harris, J. R. Epstein, C. B. Mason, and N. F. Davis	AAPG Bulletin
Rat Creek Quartz Latite	middle or late Tertiary	Colo.	Rat Creek Quartz Latite redefined and restricted to northern part of Creede district, Colorado.	A revised volcanic se- quence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Redwall Limestone	Missis- sippian	Ariz.	Redwall Limestone di- vided into four members in ascending order: Whitmore Wash, Thunder Springs, Mooney Falls, and Horseshoe Mesa Members.	Nomenclature for litho- logic subdivisions of the Mississippian Redwall Limestone, Arizona, by E. D. McKee	Annual Review 1963
Renault Limestone	Late Missis- sippian (Chester)	Ky.	Renault Limestone to be used in Hopkins- ville area, Renault Formation will be used elsewhere.	Geology of the Kelly quadrangle, Kentucky, by T. P. Miller	GQ Map Series
Revett Formation (of Ravalli Group) (of Belt Series)	Precambrian	Idaho and Mont.	Formerly Revett Quartzite.	Correlations and problems in Belt Series stratigra- phy, northern Idaho and western Montana, by J. E. Harrison and A. B. Campbell	GSA Bulletin
Rondout Limestone (of Cayuga Series)	Late Silurian and Devonian	N. Y., N. J. and Pa.	Former age Late Si- lurian. Includes Glasco, Whiteport, and Wilbur Members. The Silurian-Devonian boundary is placed within the Rondout Limestone.	The Helderberg Group and the position of the Si- lurian-Devonian boundary in North America, by J. M. Berdan	Bulletin

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
San Juan Formation	middle and late Tertiary	Colo.	Formerly San Juan Tuff of Miocene(?) age.	Tertiary volcanic stra- tigraphy in the western San Juan Mountains, Colo- rado, by R. G. Luedke and W. S. Burbank	Annual Review 1963
Seymour Canal Formation (of Stephens Passage Group)	Late Jurassic and Early Cretaceous	Alaska	Seymour Canal Forma- tion assigned to Stephens Passage Group.	Reconnaissance geology of Admiralty Island, Alaska, by E. H. Lathram, J. S. Pomeroy, H. C. Berg, and R. A. Loney	Bulletin
Silverton Volcanic Group	middle and late Tertiary	Colo.	Formerly Silverton Volcanic Series of Miocene age.	Tertiary volcanic stra- tigraphy in the western San Juan Mountains, Colo- rado, by R. G. Luedke and W. S. Burbank	Annual Review 1963
Sunshine Peak Rhyolite (of Potosi Volcanic Group)	middle and late Tertiary	Colo.	Assigned to the Potosi Volcanic Group. Age changed from Miocene to middle and late Tertiary.	Tertiary volcanic stra- tigraphy in the western San Juan Mountains, Colo- rado, by R. G. Luedke and W. S. Burbank	Annual Review 1963
Swan Peak Quartzite	Middle Ordovician	Idaho	Swan Peak Quartzite in report area. Remains Swan Peak Formation elsewhere.	Paleozoic section south- west of Pocatello, Idaho, by D. E. Trimble and W. J. Carr	AAPG Bulletin
Treasure Mountain Rhyolite	middle and late Tertiary	Colo.	Replaced by the Gilpin Peak Tuff in the western San Juan Moun- tains.	Tertiary volcanic stra- tigraphy in the western San Juan Mountains, Colo- rado, by R. G. Luedke and W. S. Burbank	Annual Review 1963

NAMES REVISED (Cont'd.)

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Revision</u>	<u>Report in which revised usage was adopted</u>	<u>Used in</u>
Tuxedni Group	Middle and Late Jurassic	Alaska	Formerly Tuxedni For- mation of Middle Jurassic age.	Revised stratigraphic nomenclature and age for the Tuxedni Group in the Cook Inlet region, Alaska, by R. L. Detterman	Annual Review 1963
Vernal Mesa Quartz Monzonite	Precambrian	Colo.	Formerly Vernal Mesa Granite	The Black Canyon of the Gunnison, today and yester- day, by W. R. Hansen	Bulletin
Wilbur Member (of Rondout Lime- stone)	Late Silurian	N. Y.	Formerly Wilbur Lime- stone Member of Salina Formation	The Helderberg Group and the position of the Si- lurian-Devonian boundary in North America, by J. M. Berdan	Bulletin
Willow Creek Member (of Bachelor Mountain Rhyolite)	middle or late Tertiary	Colo.	Formerly Willow Creek Rhyolite of Miocene age.	A revised volcanic se- quence in the central San Juan Mountains, Colo- rado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Windy Gulch Member (of Bachelor Mountain Rhyolite)	middle or late Tertiary	Colo.	Formerly Windy Gulch Rhyolite Breccia of Miocene age.	A revised volcanic se- quence in the central San Juan Mountains, Colo- rado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Winterset Limestone (of Dennis Limestone) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Nebr. and Iowa	Formerly Winterset Limestone of Pennsyl- vanian age.	Geology of the Omaha- Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper

IV. CHANGES IN AGE DESIGNATIONS

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Alta Formation	Early Permian (Wolfcamp)	Permian	Tex.	West Coast region by K. Ketner (In Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Battleground Schist	Ordovician to Mississippian	Precambrian(?) or Paleozoic(?)	N. C. and S. C.	Provisional geologic map of the crystalline rocks of South Carolina, by W. C. Overstreet and Henry Bell, 3d	Bulletin
Bessemer Granite	Ordovician to Mississippian	Precambrian	N. C. and S. C.	Provisional geologic map of the crystalline rocks of South Carolina, by W. C. Overstreet and Henry Bell, 3d	Bulletin
Bethany Falls Limestone Member (of Swope Limestone) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Blacksburg Schist	Ordovician to Mississippian	Cambrian(?)	N. C. and S. C.	Provisional geologic map of the crystalline rocks of South Carolina, by W. C. Overstreet and Henry Bell, 3d	Bulletin
Bonner Springs Shale (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Cannery Formation	Early Permian	Permian	Alaska	Reconnaissance geology of Admiralty Island, Alaska, by E. H. Lathram, J. S. Pomeroy, H. C. Berg, and R. A. Loney	Bulletin
Captain Creek Limestone Member (of Stanton Limestone) (of Lansing Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Casper Formation	Late Pennsylvanian and Early Permian	Pennsylvanian and Permian	Wyo.	East Wyoming and Montana, North and South Dakota, by E. K. Maughan (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Chanute Shale (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Cherryvale Formation (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Cherryville Quartz Monzonite	Mississippian(?) to Permian(?)	Devonian(?)	N. C. and S. C.	Provisional geologic map of the crystalline rocks of South Carolina, by W. C. Overstreet and Henry Bell, 3d	Bulletin
Cibolo Formation	Early Permian (Wolfcamp and Leonard)	Permian	Tex.	West Texas region, by S. S. Oriel, D. Myers, and E. Crosby (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Cieneguita Formation	Middle and Late Pennsylvanian	Pennsylvanian and Permian	Tex.	West Texas region, by S. S. Oriel, D. Myers, and E. Crosby (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Concha Limestone (of Naco Group)	Early Permian	Permian	Ariz.	Arizona and west New Mexico, by E. D. McKee (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Coyote Butte Formation	Early Permian (Leonard and Wolfcamp)	Permian	Ore.	West Coast region, by K. Ketner (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
De Chelly Sandstone	Early Permian (Leonard)	Permian	Colo. and Utah	Western Colorado and Utah, by W. E. Hallgarth (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Diablo Formation	Permian (Guadalupe)	Permian	Nev.	West Coast region, by K. Ketner (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Dimple Limestone	Middle Pennsylvanian	Pennsylvanian	Tex.	West Coast region, by S. S. Oriel, D. Myers, and E. Crosby (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Douglas Island Volcanics (of Stephens Passage Group)	Late Jurassic and Early Cretaceous	Jurassic(?) to Early Cretaceous(?)	Alaska	Reconnaissance geology of Admiralty Island, Alaska, by E. H. Lathram, J. S. Pomeroy, H. C. Berg, and R. A. Loney	Bulletin
Draytonville Conglomerate Member (of Kings Mountain Quartzite)	Ordovician to Mississippian	Cambrian	N. C. and S. C.	Provisional geologic map of the crystalline rocks of South Carolina, by W. C. Overstreet and Henry Bell, 3d	Bulletin
Drum Limestone (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Elkhorn Ridge Argillite	Early Permian (Leonard)	Pennsylvanian(?)	Ore.	West Coast region, by K. Ketner (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Englewood Formation	Devonian and Mississippian	Early Mississippian	N. Dak. and S. Dak.	Dark shale unit of Devonian and Mississippian age in northern Wyoming and southern Montana, by C. A. Sandberg	Annual Review 1963
Epitaph Dolomite (of Naco Group)	Early Permian	Permian	Ariz.	Arizona and west New Mexico, by E. D. McKee (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Eudora Shale Member (of Stanton Limestone) (of Lansing Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Farley Limestone Member (of Wyandotte Limestone) (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Fountain Formation	Middle and Late Pennsylvanian and Early Permian	Pennsylvanian and Permian	Wyo., Mont., N. Dak. and S. Dak.	East Wyoming and Montana, North and South Dakota, by E. K. Maughan (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Gaffney Marble	Mississippian	Cambrian(?)	N. C. and S. C.	Provisional geologic map of the crystalline rocks of South Carolina, by W. C. Overstreet and Henry Bell, 3d	Bulletin
Galesburg Shale (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Gaptank Formation	Middle and Late Pennsylvanian and Early Permian	Pennsylvanian	Tex.	West Texas region, by S. S. Oriel, D. Myers, and E. Crosby (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Haymond Formation	Middle Pennsylvanian	Pennsylvanian	Tex.	West Texas region, by S. S. Oriel, D. Myers, and E. Crosby (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Henderson Gneiss	Ordovician to Devonian	Precambrian or early Paleozoic	N. C. and S. C.	Provisional geologic map of the crystalline rocks of South Carolina, by W. C. Overstreet and Henry Bell, 3d	Bulletin
Hermit Shale (of Aubrey Group)	Early Permian (Leonard)	Permian	Utah and Ariz.	Arizona and west New Mexico, by E. D. McKee (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Hermosa Formation	Middle and Late Pennsylvanian	Middle Pennsylvanian	Utah	Geology and uranium deposits of Elk Ridge and vicinity, San Juan County, Utah, by R. Q. Lewis, Sr., and R. H. Campbell	Prof. Paper
Hesse Quartzite (of Chilhowee Group)	Early Cambrian	Early Cambrian(?)	N. C. and Tenn.	Geology of the western Great Smoky Mountains, Tennessee, by R. B. Neuman and W. H. Nelson	Prof. Paper
Hickory Creek Shale Member (of Plattsburg Limestone) (of Lansing Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Hodge Volcanic Formation	Mesozoic and Permian (Ochoa?)	Mesozoic or older	Calif.	West Coast region, by K. Ketner (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Hovey Formation	Silurian	Early Silurian(?)	Maine	Geology of the Bridgewater quadrangle, Aroostook County, Maine, by Louis Pavlides	Prof. Paper or Bulletin
Hunter Mountain Quartz Monzonite	Jurassic or Cretaceous	Cretaceous(?)	Calif.	Geology of the Independence quadrangle, Inyo County, California, by D. C. Ross	Bulletin

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Iola Limestone (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Johnnie Formation	Precambrian	Early Cambrian	Calif. and Nev.	General geology of Death Valley, California, by C. B. Hunt	Prof. Paper
Kansas City Group (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Kings Mountain Quartzite	Ordovician to Mississippian	Cambrian	N. C. and S. C.	Provisional geologic map of the crystalline rocks of South Carolina, by W. C. Overstreet and Henry Bell, 3d	Bulletin
Lane Shale (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Lansing Group (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
McCloud Limestone	Early Permian (Leonard and Wolfcamp)	Permian	Calif.	West Coast region, by K. Ketner (In Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Mammoth Mountain Rhyolite	middle or late Tertiary	Miocene	Colo.	A revised volcanic sequence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Meduxnekeag Formation	Early(?), Middle, and Late(?) Ordovician	Middle Ordovician	Maine	Geology of the Bridgewater quadrangle, Aroostook County, Maine, by Louis Pavlides	Prof. Paper or Bulletin
Merriam Limestone Member (of Plattsburg Limestone) (of Lansing Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Minnekahta Limestone	Early Permian (Leonard)	Permian	Wyo., Mont., N. Dak., and S. Dak.	East Wyoming and Montana, North and South Dakota, by E. K. Maughan (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Minnelusa Formation	Middle and Late Pennsylvanian and Early Permian	Pennsylvanian and Permian	Wyo., Mont., N. Dak., and S. Dak.	East Wyoming and Montana, North and South Dakota, by E. K. Maughan (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Murray Shale	Early Cambrian	Early Cambrian(?)	N. C. and Tenn.	Geology of the western Great Smoky Mountains, Tennessee, by R. B. Neuman and W. H. Nelson	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Nikolai Greenstone	Middle or Late Triassic	Permian and Triassic(?)	Alaska	Preliminary geologic map of the McCarthy C-5 quadrangle, Alaska, by E. M. MacKevett, Jr.	I Map Series
Noonday Dolomite	Precambrian	Early Cambrian	Calif.	General geology of Death Valley, California, by C. B. Hunt	Prof. Paper
Opeche Shale	Early (Leonard)	Permian	Wyo., Mont., N. Dak., and S. Dak.	East Wyoming and Montana, North and South Dakota, by E. K. Maughan (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Pablo Formation	Permian (Ochoa?)	Permian(?)	Nev.	West Coast region, by K. Ketner (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Rainvalley Formation (of Naco Group)	Permian (Leonard and Guadalupe?)	Permian	Ariz. and N. Mex.	Arizona and west New Mexico, by E. D. McKee (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Reeve Meta-Andesite	Permian (Guadalupe)	Pennsylvanian	Calif.	West Coast region, by K. Ketner (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Rest Spring Shale	Late Mississippian and Pennsylvanian(?)	Mississippian and Pennsylvanian(?)	Calif.	Geology of the Independence quadrangle, Inyo County, California, by D. C. Ross	Bulletin

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Retreat Group	Middle(?) Devonian	Silurian and Devonian	Alaska	Reconnaissance geology of Admiralty Island, Alaska, by E. H. Lathram, J. S. Pomeroy, H. C. Berg and R. A. Loney	Bulletin
Rico Formation	Pennsylvanian and Permian	Pennsylvanian and Permian(?)	Utah	Geology and uranium deposits of Elk Ridge and vicinity, San Juan County, Utah, by R. Q. Lewis, Sr., and R. H. Campbell	Prof. Paper
Robinson Formation	Permian (Guadalupe)	Pennsylvanian	Calif.	West Coast region, by K. Ketner (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Rock Lake Shale Member (of Stanton Limestone) (of Lansing Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
San Andres Limestone	Permian (Leonard and Guadalupe)	Permian	Tex. and N. Mex.	West Texas region, by S. S. Oriel, D. Myers, and E. Crosby (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
San Angelo Sandstone (of Pease River Group)	Early Permian (Leonard)	Permian	Tex.	West Texas region, by S. S. Oriel, D. Myers, and E. Crosby (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Scherrer Formation (of Naco Group)	Early Permian	Permian	Ariz. and Nebr.	Arizona-West New Mexico, by E. D. McKee (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
South Bend Limestone Member (of Stanton Limestone) (of Lansing Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Spring Hill Limestone Member (of Plattsburg Limestone) (of Lansing Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Spruce Top Greenstone	Silurian(?) and Devonian(?)	Silurian(?)	Maine	Geology of the Bridgewater quadrangle, Aroostook County, Maine, by Louis Pavlides	Prof. Paper or Bulletin

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Stanton Limestone (of Lansing Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Stirling Quartzite	Precambrian	Early Cambrian	Calif.	General geology of Death Valley, California, by C. B. Hunt	Prof. Paper
Stoner Limestone Member (of Stanton Limestone) (of Lansing Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Swope Limestone (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Tesnus Formation	Mississippian and Pennsylvanian	Pennsylvanian	Tex.	West Texas region, by S. S. Oriel, D. Myers, and E. Crosby (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Tinemaha Granodiorite	Jurassic or Cretaceous	Cretaceous	Calif.	Geology of the Independence quadrangle, Inyo County, California, by D. C. Ross	Bulletin
Vale Formation (of Clear Fork Group)	Early Permian (Leonard)	Permian	Tex.	West Texas region, by S. S. Oriel, D. Myers, and E. Crosby (<u>In</u> Paleotectonic maps of the Permian System, by McKee and others)	Prof. Paper
Vilas Shale (of Lansing Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper
Whiteside Granite	Ordovician to Devonian	late Carboniferous(?)	N. C. and S. C.	Provisional geologic map of the crystalline rocks of South Carolina, by W. C. Overstreet and Henry Bell, 3d	Bulletin
Wood Canyon Formation	Early Cambrian and Early Cambrian(?)	Early Cambrian	Calif.	General geology of Death Valley, California, by C. B. Hunt	Prof. Paper
Wyandotte Limestone (of Kansas City Group) (of Missouri Series)	Late Pennsylvanian	Pennsylvanian	Nebr. and Iowa	Geology of the Omaha-Council Bluffs area, Nebraska-Iowa, by R. D. Miller	Prof. Paper

CHANGES IN AGE DESIGNATIONS (Cont'd.)

<u>Name</u>	<u>New age designation</u>	<u>Former age designation</u>	<u>Location</u>	<u>Report in which designation was changed</u>	<u>Used in</u>
Yorkville Quartz Monzonite	Permian	Early Mississippian(?)	N. C. and S. C.	Provisional geologic map of the crystalline rocks of South Carolina, by W. C. Overstreet and Henry Bell, 3d	Bulletin

VI. NAMES ABANDONED

<u>Name</u>	<u>Age</u>	<u>Location</u>	<u>Report upon which abandonment was based</u>	<u>Used in</u>
Benson Limestone (of Lexington Group)	Middle Ordovician	Ky.	Geology of the Tyrone quadrangle, Kentucky, by E. R. Cressman	GQ Map Series
Equity Quartz Latite	Miocene	Colo.	A revised volcanic sequence in the central San Juan Mountains, Colorado, by T. A. Steven and J. C. Ratte	Annual Review 1963
Jessamine Limestone (of Lexington Group)	Middle Ordovician	Ky.	Geology of the Tyrone quadrangle, Kentucky, by E. R. Cressman	GQ Map Series
Symonds Formation	Early Cretaceous(?)	Alaska	Reconnaissance geology of Admiralty Island, Alaska, by E. H. Lathram, J. S. Pomeroy, H. C. Berg, and R. A. Loney	Bulletin

GEOLOGIC NAMES COMMITTEE
July 2, 1963

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